

Canada and U.S. still haggling over fishing boundaries

TALKS ON new ocean boundaries between Canada and the United States, arising from their 200-mile zones, were extended for a second time in January.

Washington lawyer Lloyd Cutler and Canada's Ambassador to the European Economic Community, Marcel Cadieux, were expected to meet again in mid-February for another, and hopefully final, session.

They began their deliberations in September. In an interim report in October, they proposed joint commissions to manage fisheries which affected both zones and shared access for hydrocarbon resources. These moves could reduce the

importance of where the boundary line would go.

They had four boundaries to agree on in the Gulf of Maine where Canada claimed part of the rich Georges Bank seaward from the Strait of Juan de Fuca between the State of Washington and the province of British Columbia; between B.C. and the Alaskan Panhandle; and in the Beaufort Sea in the Arctic between Alaska and the Yukon Territory.

By the end of January, Cadieux and Cutler had reached the point where the Gulf of Maine boundary and the divide of trans-boundary fish stocks on both coasts were the main issues.

Russian eye on Pacific

THE Soviet Union is planning expeditions into areas of the Pacific Ocean to "define new potential fishing targets."

Vladimir Kamenov, Deputy Minister of Fisheries in the USSR, says work is going on to widen the scale of fishing on the high seas and develop deepwater fishing. This has been made necessary by limits extensions which have cut Soviet fishing vessels off from many of their grounds.

There were changes in the species of fish being brought in. It was necessary therefore to work to increase the variety available and to improve the quality of new species.

The Soviet processing industry, he said, aimed to raise the percentage of fish used for food products and for canning by about 15 per cent from the 1975 level of 65 per cent.

CORAL DANGER

BLASTING or breaking up of coral reef can cause explosive outbreaks of ciguatera fish poisoning, according to the World Health Organisation.

Normally many different edible fish feed on the algae of coral reefs. Dinoflagellates (microscopic plants) live attached to these algae and they produce small amounts of toxin which gets more and more concentrated in the food chain.

With the disturbance of the environment of these organisms — the coral reef — they proliferate.

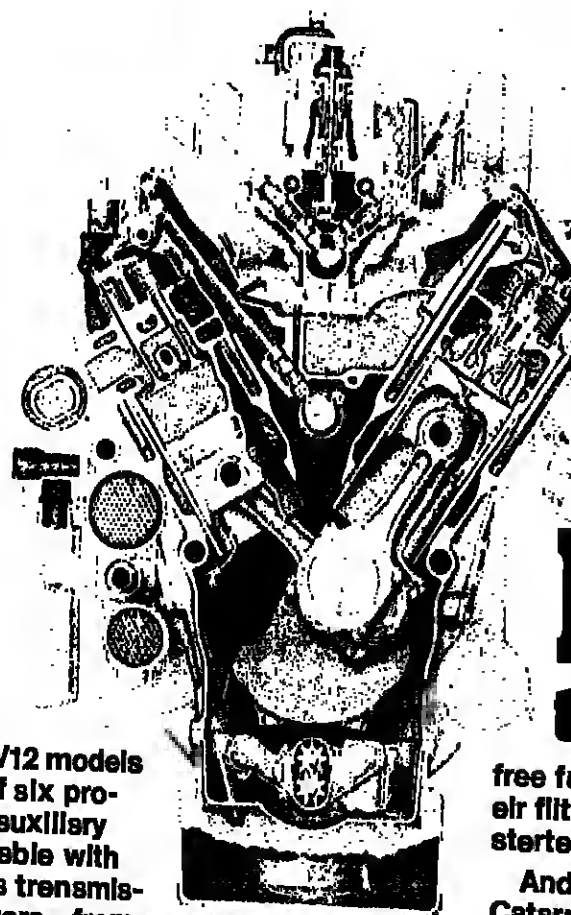
The toxic content of the algae increases. Feeding fish take in a larger amount, and humans eating the fish run the risk of poisoning.

Roumania deal

ROUMANIA is the latest of the countries fishing off the east coast of Canada to come to an agreement over fishing inside the 200-mile zone.

The agreement sets out the terms and conditions governing continued fishing by Roumanian ships inside the Canadian EEZ.

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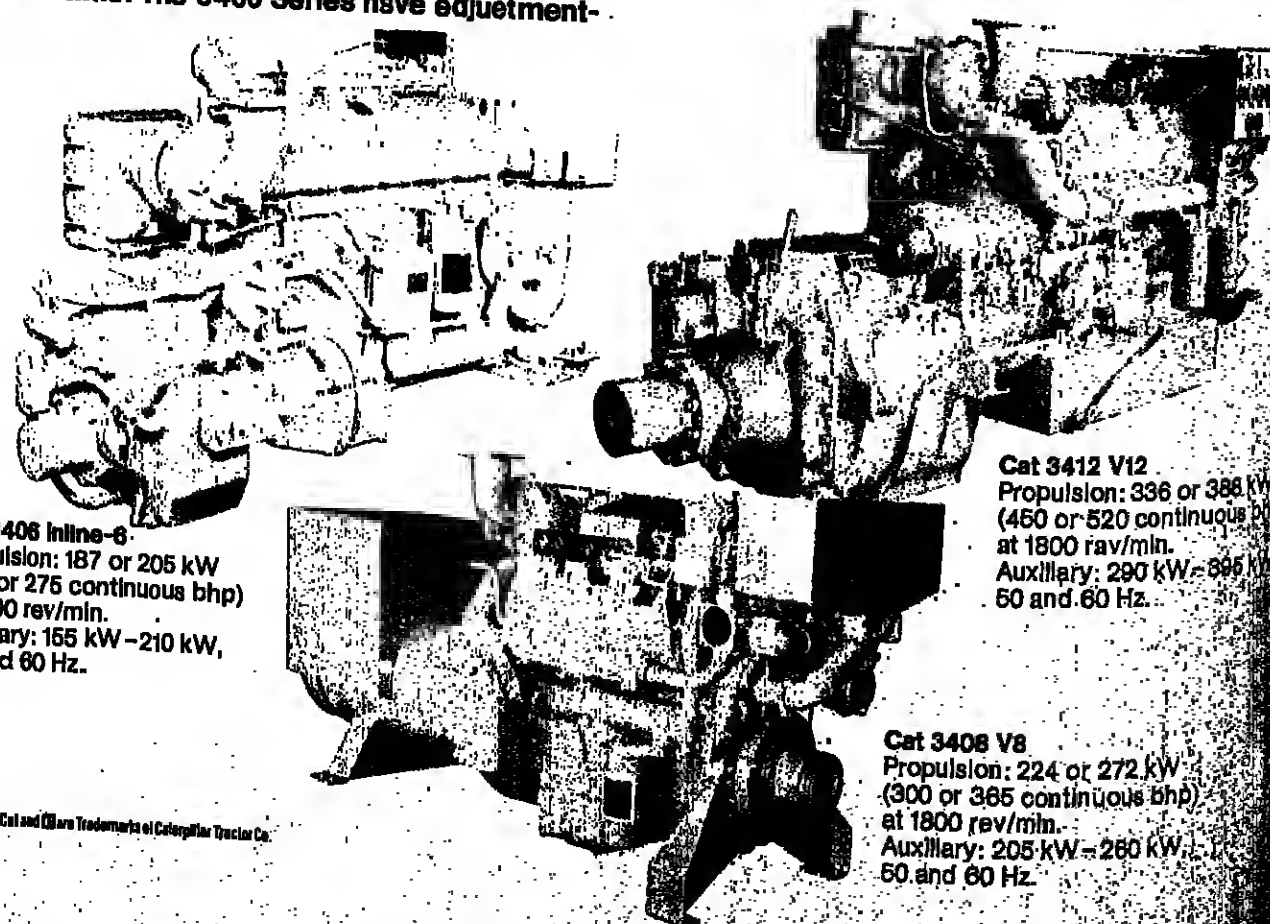


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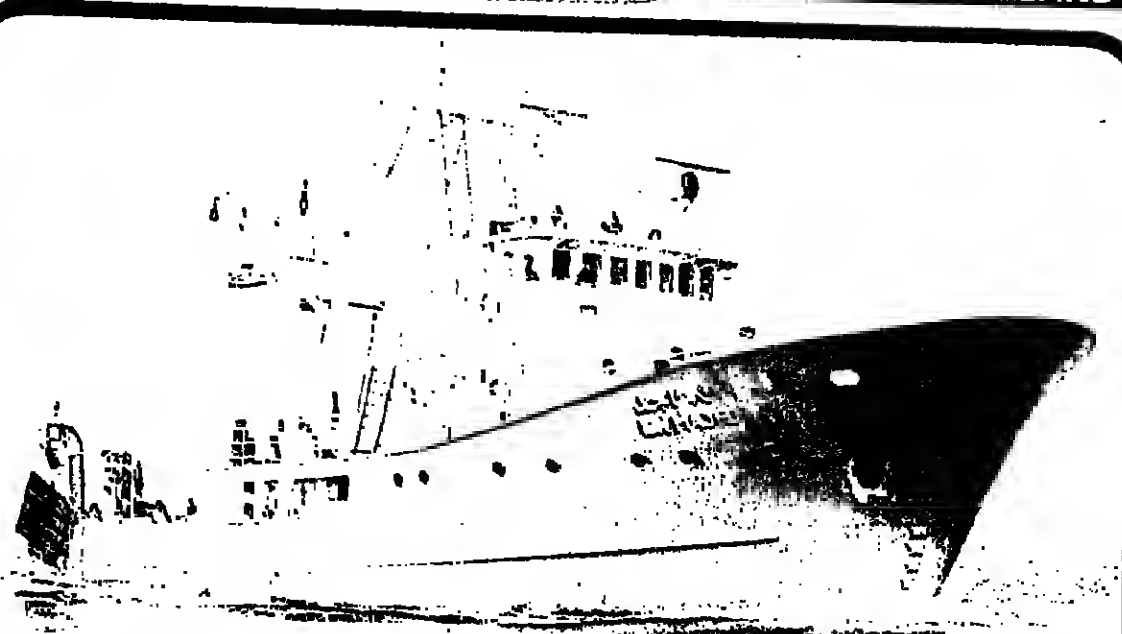
April 1978 Vol 17 No. 4

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SUPER SHIPS FOR A NEW FISHERY



**Saudi Arabia's bargain research
ship—turn to page 14**

EVER-INVENTIVE. Norway's fishing industry has developed a new breed of ship to meet the challenge of a new fishery. The fishery is that for blue whiting in the north-east Atlantic; the ships include the 55.7 metre long *Torbas* and the 71.3 metre *Libas*, the largest and fastest Norwegian fishing vessel.

Blue whiting is among the last of the great underused resources still available in the North Atlantic region. Several Western European countries

have been working out ways of exploiting it.

Norway has been taking the lead and in 1977 her catch moved to 38,000 tons, almost all of it for reduction to meal. In the new agreements with the EEC countries over fishing in each other's limits, blue whiting is temporarily exempted from quotas.

No doubt, these will one day be applied. Until then, the fish race is on and the prize of big catches will go to the ships with the capacity and the design to use the resource. But for Norway the same ships must also be able to participate in the winter and summer capelin fisheries when the blue whiting are not concentrated.

The designer's answer is a large deep-sea combination ship — purse seiner for capelin and mid-water trawler for blue whiting.

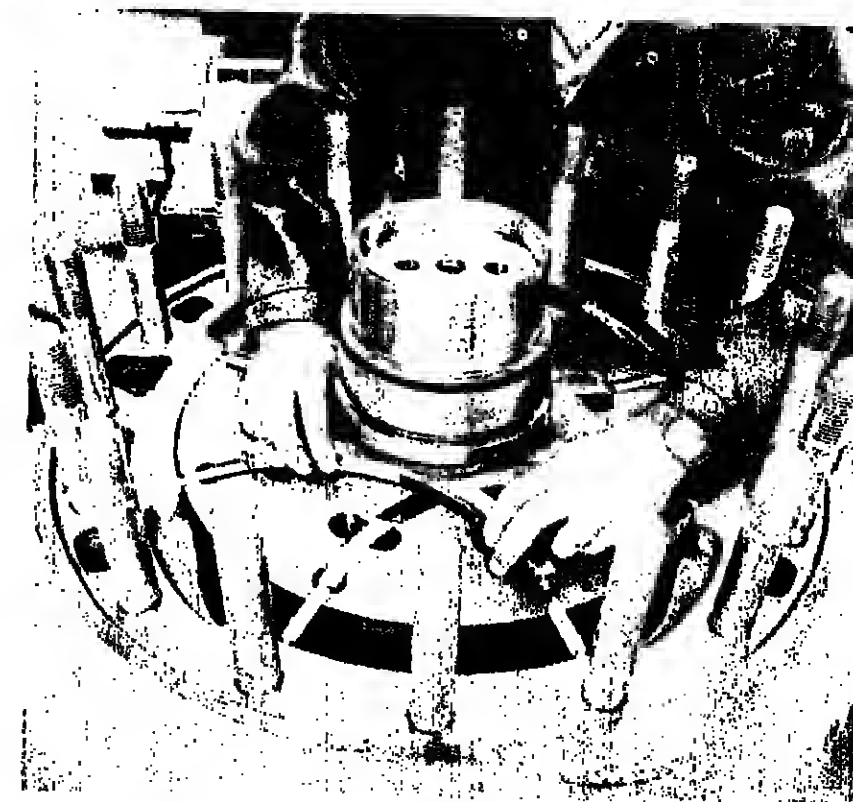
This year, the capelin catch has been disappointing. By mid-March it was only about half what it was in winter 1977.

For blue whiting, however, all the signs point to a further big jump in catch this year. And the most prominent of these signs are the new super ships, such as the *Torbas* and the *Libas*.

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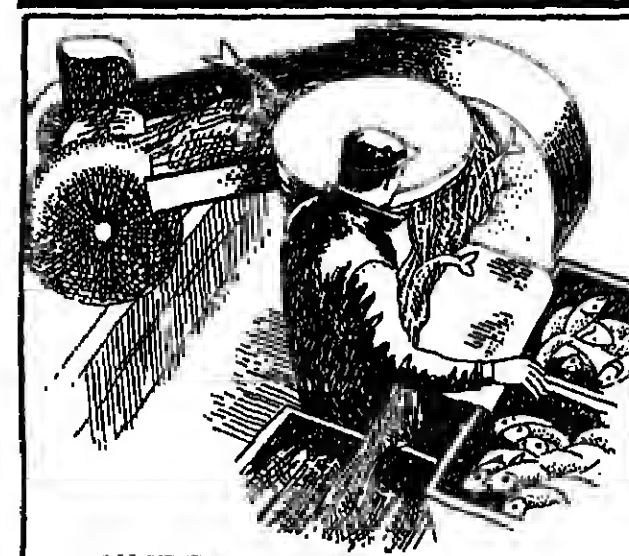


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BEACHES, shellfish beds and fishery areas along a large part of the coast of Brittany in France vanished under a blanket of oil last month as a wrecked tanker spilled her 230,000-ton cargo into the sea. It was the worst pollution disaster of its kind, mitigated only by the fact that the oil (light Arabian crude) is less lethal than some other types that have been released in the past.

It does tend to disperse in heavy seas and the mousse it forms under the effects of rough weather is not as sticky or as persistent as the Kuwait crude which spilled from the tanker *Torrey Canyon*.

Little consolation

But this was little consolation for fishermen from just north of Brest and round the western extremes of the Brittany coast.

The tanker *Amoco Cadiz* was on her way from the Persian Gulf to Britain on March 16 when her steering gear failed. She was then about ten miles off Brest in heavy seas and a force 8-9 gale. Later a tug took her in tow but this parted and the *Amoco Cadiz* grounded on sharp rocks on the Brittany coast.

Her captain was arrested after coming ashore with his crew and on

Worst-ever spill hits Brittany's fishermen

March 20 he was charged with polluting the high seas.

Soon after the stranding, the ship began to break up and the first oil slicks moved along the coast. On March 24 she split in two.

Share the fate

The English Channel Islands, with their £1 million fishery industry, were expecting to share the fate of the Brittany fisheries. But the weather and the nature of the oil worked to their advantage. The pollution feared during Easter did not come. Although close last week, it was hoped that the precautions taken would contain the oil.

PERU STILL HOPES FOR MEAL CATCH

FISHERMEN in Peru, optimistically predict a catch of 1.5 to 1.8 million tons this year for the plants, despite the fishing for anchovy.

More than 5000 (including anchovy) were in the first six months of 1978 before industrial was suspended on 16/10.

The industry believes that should be about a million tons of sardines, other food fish and shellfish, although sardine catch has dropped now that the sea is getting cooler.

Calculations

Calculations of new material include: tons of by-catch at plant rejects.

A 1.8 m ton supply gave about 300,000 metric, assuming a yield of 4.6. The catch is expected to use 10% of meat in 1978, 250,000 tons for export.

Last year, Peru net over two million tons into meal. Anchovy, 792,085 tons of the total, 40% of meat was produced. Peruvian, the sea-chovy company, says needs at least 1.8 million this year to cover its costs.

NORWAY CAPELIN LET-DOWN

Canadian fisheries minister Romeo LeBlanc: Asked for a separate department to ease the work load.



Canada gets a new department of fisheries

A SEPARATE department of fisheries and oceans is to be created by the Canadian government when the proposal gets the approval of Parliament, Fisheries Minister Romeo LeBlanc announced last month.

Fisheries now form part of the federal environment department. They would move into the new department along with ocean and aquatic sciences. Legislation for the change has been prepared but may not go through before Parliament dissolves for a general election in the summer.

A separate department was promised in the 1974 election but all that came of this was the appointment of Romeo LeBlanc as a junior minister to handle fisheries. He has doubled on occasions as environment minister and last year asked for a separate department to ease the work load.

International treaties

The new department would manage fisheries and carry out research into marine resources off the Atlantic, Arctic and Pacific coasts. It would run harbours, handle charting and negotiate international treaties.

In 1977, the value of Canada's fish landings exceeded \$1,000 million for the first time. According to LeBlanc, the proposal for the new department "demonstrates the priority the government attaches to enhancing the Canadian fishery, to our growing management responsibilities and to the need for a comprehensive approach to fisheries and ocean issues."

He added that the government's spending on ocean sciences had risen to \$57 million, from \$33 million in 1973, and was more than the amount spent by the United States, Britain, France, Japan or Australia.

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Canners hit by catch slumps

SLUMPS in the stocks of two of the world's greatest sources of canned fish have led in an anxious search for substitute species, and other packing areas.

Fish canners in West Germany and Britain, already hit by the conservation restrictions on North Sea herring catching, are now beginning to feel the draft of the pilchard shortage in Southern Africa (see *ENI*, January 1978).

Importing

West German canners are reported to be importing pilchards from Cornwall and sardines from South America, and they are buying herrings from North America.

West Germany used to process 220,000 to 250,000 tons a year, but some plants are now working at only quarter to half their capacity.

Season starts badly as the shoals stay deep

ALTHOUGH it picked up during March, Norway's big fishery for winter capelin yielded catches well below those of 1977 and 1976.

The fishery opened on January 12 but the first catch was not reported until ten days later. By early last month, the catch was only 2.5 million hectolitres (one hl of capelin equals 97 kilos) compared with 7.6 million hl at the same time in 1977.

Fishing improved later in the month and meat plants were allowed to take in capelin catches during the Easter holiday period, when they are normally closed.

Although the State Labour Inspectorate had previously refused permission for this, following pressure by meat plant workers, it relented when fishermen explained that holiday landings were necessary to make up for the poor start to the season.

Long time

More than 100 trawlers and purse seiners participate in the fishery, and some went a long time before taking a single fish.

Apart from bad weather, fishermen reported difficulties because the capelin were staying on the bottom at depths beyond reach.

Last winter, the capelin catch was 14.6 m. hl, and another 7.2 m. hl came in the summer. This 2.1 m. ton record harvest made up 67 per

cent of Norway's 1977 catch. This year, for the first time, the Fisheries Ministry set a quota of 11.5 m. hl. For the winter fishing, this total remains, but allocations for individual vessels have been dropped.

Another fishery slow to come up to expectations was that for roe herring in British Columbia (see page 20).

By late March, reports *ENI* correspondent Les Rimes, only 47,000 tons of an 82,500-ton quota had been taken.

Catches on the west coast of Vancouver Island, generally regarded as the heaviest, have

been down but fishing was good around the Queen Charlotte Islands.

The herrings are sought for their roe, which is exported to Japan, and so they have to be caught before they spawn.

This year the main fishery was delayed several days because the fish had not matured. When it opened, some 6,000 fishermen mauling purse seiners and collector trawlers.

If a full quota is taken, the fishery will supply about 11,500 tons of roe. The rest of the fish is reduced to meal, but this year attempts are being made to open up a food market for Pacific herrings in Western Europe.

Japan-USSR crab deal

TWO Japanese companies, Hoko Fishing Company and the Marubeni Corporation, are to work with the USSR Ministry of Fisheries in the catching of snow crabs off Cape Olyutorski in the Soviet Far East.

This ground is on the eastern side of the Kamchatka Peninsula and comes within the Soviet 200-mile economic zone.

The agreement therefore allows the Japanese to work in the zone while giving Soviet fishermen the benefit of their expertise in harvesting and processing snow crabs.

In their joint project, the Japanese and Soviet vessels are expected to harvest some 3,000 tons of crabs a year.

Hoko and Marubeni will buy the catch

for marketing in Japan. The project is expected to start in May.

In another Japanese venture abroad, the giant Iryo Fishing Company is planning to have 12 shrimp boats built at a cost of 2,500 million yen (15.3 million).

Better prospects

From experience with the first years of 200-mile economic zones, Tokyo and other Japanese fishing concerns have been finding that investing in shrimp activities abroad is more economic and has better prospects than direct buying.

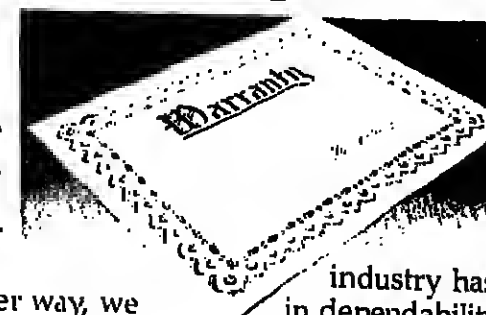
During 1977, Tokyo handled 20,000 million yen (some £70 million) worth of shrimp, and overseas subsidiaries accounted for a third of this.

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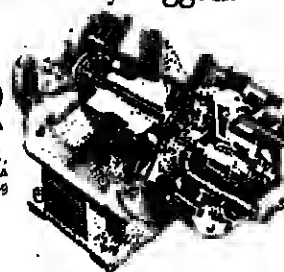
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Small mesh can be expensive

THE COMMANDERS of several foreign fishing vessels have appeared in Canadian courts in the past few years on charges relating to 200-mile economic regulations.

Among the latest of these is Soviet skipper Yevgeniy Gusev of the trawler *Vyhorokayn Starona* charged in St. John's with using an undersized mesh off Newfoundland. He was fined \$1,000 and ordered to pay \$4,000 for fish taken by the net.

Captain Demetrio Hinojosa of the Spanish trawler *Arriscada* was found guilty last month of fishing with small mesh. He was fined \$5,500 and ordered to pay \$9,900 — the estimated value of the fish caught.

Undersized mesh also put Captain Kurt Enger of the West German trawler *Geeste* in St. John's court in February. He was fined

\$5,000, had his vessel confiscated, and had to pay \$25,000.

An East German Captain Franz Boller of the trawler *Werner Kube* was fined \$3,000 in the same court for his catch was confiscated.

Concerned

Concerned over the timing, use of small mesh, Canadian officials have been warning of penalties and fines for the use of undersized mesh. Changes in the fisheries law in the Canadian government order catching vessels, gear and

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Seal support criticised

NORWEGIAN sealing akipors and sealing boat owners, in a joint letter to the Fisheries Director, express their "concern" that Crown Prince Harald is a patron of the World Wildlife Fund.

This organisation, they say, has urged that sealing should be halted or limited, "and this can only be interpreted as criticism of the Norwegian authorities' measures for protecting seal stocks."

According to the Norwegian Sealing Council, new scientific data confirm that more than 200,000 Greenland seals can be killed annually without risk to stocks. These stocks are increasing by between 310,000 and 350,000 a year, while the catch quota fixed for 1978 is 180,000.

Georges Bank deadlock

POLITICAL considerations and the importance of Georges Bank in the Gulf of Maine have combined to stop talks between Canada and the United States over extended fisheries zone boundaries.

The halt came in mid-March as the two negotiators sent a joint report to their governments proposing an interim arrangement and authority to resume talks. But this will only be after the two governments have had time to consider the recommendations and to let some political pressures expire.

US-Canada fish talks

await elections

The bitter fight over the Panama Treaty in the United States has not made a healthy atmosphere for acceptance of boundary concessions to Canada, reports our

correspondent.

In Canada, the federal government and the Nova Scotia government both face elections in the summer and the negotiators have suggested these should precede further talks.

The political future of at least one Canadian minister could depend on the outcome of the talks, and the Nova Scotia government might find re-election difficult.

The joint report urges the two governments to begin implementing the fisheries commissions and shared-access ly-

direction zones the negotiators proposed last autumn. They also propose solutions to some difficult fishery issues.

Neither side is prepared to move over a boundary line for Georges Bank. The negotiation could reach a solution which might be acceptable to the two central governments but not to the provincial governments in Canada or regional fisheries councils in the United States.

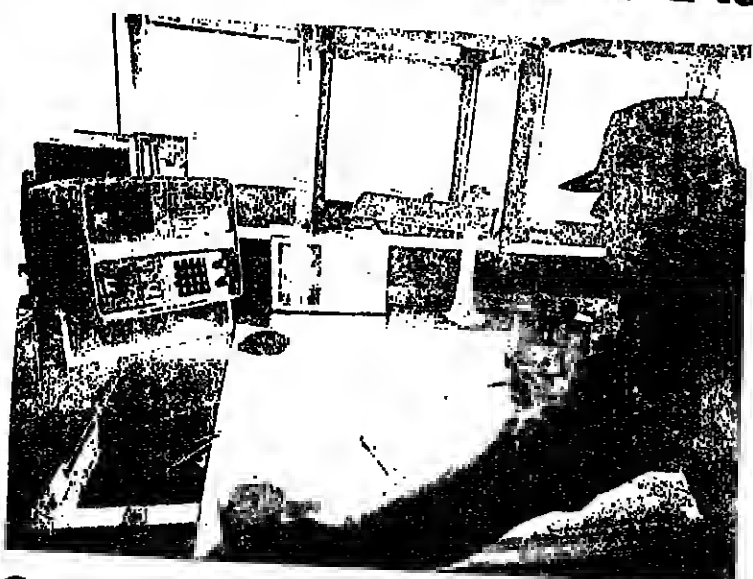
Four disputed boundaries exist between the two countries, arising from overlaps in the 200-mile limits proclaimed last year.

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NEWS IN BRIEF

SINCE February 19 Swedish last three remaining passenger ships have had no fish. Mackerel was one of the species they sought but the have been squeezed out of the normal areas. This is the result of arrangements with Norway and the EEC that only allow the boats in when the season is over.

Looking for other alternatives, their crews expect to go out for blue whiting also faster.

THE organisers of the 10th United States Fish Expo expect this year's show, Boston to attract a record 100 exhibitors and some 100 visitors from the US, Canada, Europe and the Far East. A new feature will be an "in-water" display of fish vessels. Fish Expo will be the Hynes Auditorium from October 25 to October 28.

THE Greek catch last year amounted to 103,456 tons, nine per cent higher than 1976. There was an increase from 42,000 to 47,000 tons in the catches from medium scale offshore fishing and coastal fishing was up from 16,000 to 17,500 tons. From fish production from other waters also improved, from 22,690 to 25,786 tons.

BOLSONES Verit yard in Molde, Norway, has delivered its largest RSW plant. Worth 5.5 million kroner (about 2550,000) installed, the contract is for a fish transport ship based on Tenerife in the Canaries. The Dutch owner has ordered another two plants from the Norwegian yard.

THE wreck of the 14-ton Swedish trawler *Gullen* (see FNI March) has been found by a fishing vessel watching his echo sounder. She was in 40 metres of water close to the coast. A steel hull boat was found. The body of one of her crew, three brothers was found in the wheelhouse. A part of the effects of the wreck, the boat appeared undamaged.

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Readers also include designers and builders of fishing craft, makers of fish finding instruments, catching gear and processing machinery, consultants, operators of fishery protection services, and the many other people engaged in an industry that is harvesting and handling 73.5 million tons of aquatic creatures and plants a year.

FISHING LIMITS AND ISLAND STATES

THE DECISION of the South Pacific forum (meeting in Port Moresby last year) to declare 200-mile economic zones by March 31 will make fishing much more complicated for foreign vessels working in the area. The Forum also decided to set up a South Pacific Regional Fisheries Agency (SPRFA) to co-ordinate licensing of foreign ships and surveillance of the zones.

Outside fishing nations will therefore have to negotiate access with small island countries who have gained strength through acting together.

The South Pacific Forum comprises Papua New Guinea, Fiji, Tonga, Western Samoa, Solomon Islands, Nauru, Niue, Cook Islands, Gilbert Islands and Tuvalu, plus Australia and New Zealand. They have fisheries jurisdiction over some six million square miles of sea.

Other countries not in the Forum, the territories of the United States, France and Britain will be invited to join the Agency provided they "support the sovereign rights of the coastal state to conserve and manage living resources, including the highly migratory species, in its 200-mile zone."

The "migratory species" causes a complication because the United States does not recognise tuna as a resource belonging to states claiming the EEZ. This could affect the membership of American Samoa.

It might be argued that the island countries should consider compromising over tuna to make SPRFA membership complete and so ensure that this essential

comment

uniform conservation and protection arrangement is all-embracing. But fishery problems these days seldom have simple solutions.

As we have noted before in FNI the skipjack tuna is probably the most valuable and potentially the most catchable of South Pacific species now being developed.

Bulk of catch

Its vital place is also evident in the fact that tuna is estimated to have made up the bulk of a 1977 catch in the South Pacific region of 462,000 tons. And another aspect of this growing catch, doubly emphasises the need for the protection that could come with the new agency. Less than ten per

cent of the catch was taken by the South Pacific countries. The rest went to the distant water fisheries in the region, with Japan getting about 60 per cent and with smaller shares to Taiwan, South Korea and the Soviet Union.

Islands are, of course, among the greatest beneficiaries of the now-accepted exclusive economic zone. But where island countries are small, their fisheries primitive, and the resource rich and tempting, they desperately need the protection of an umbrella agency such as SPRFA.

The decision to create it and the lessons that will come from its formative period, could also be an encouragement to other groups of island nations to consider similar arrangements.

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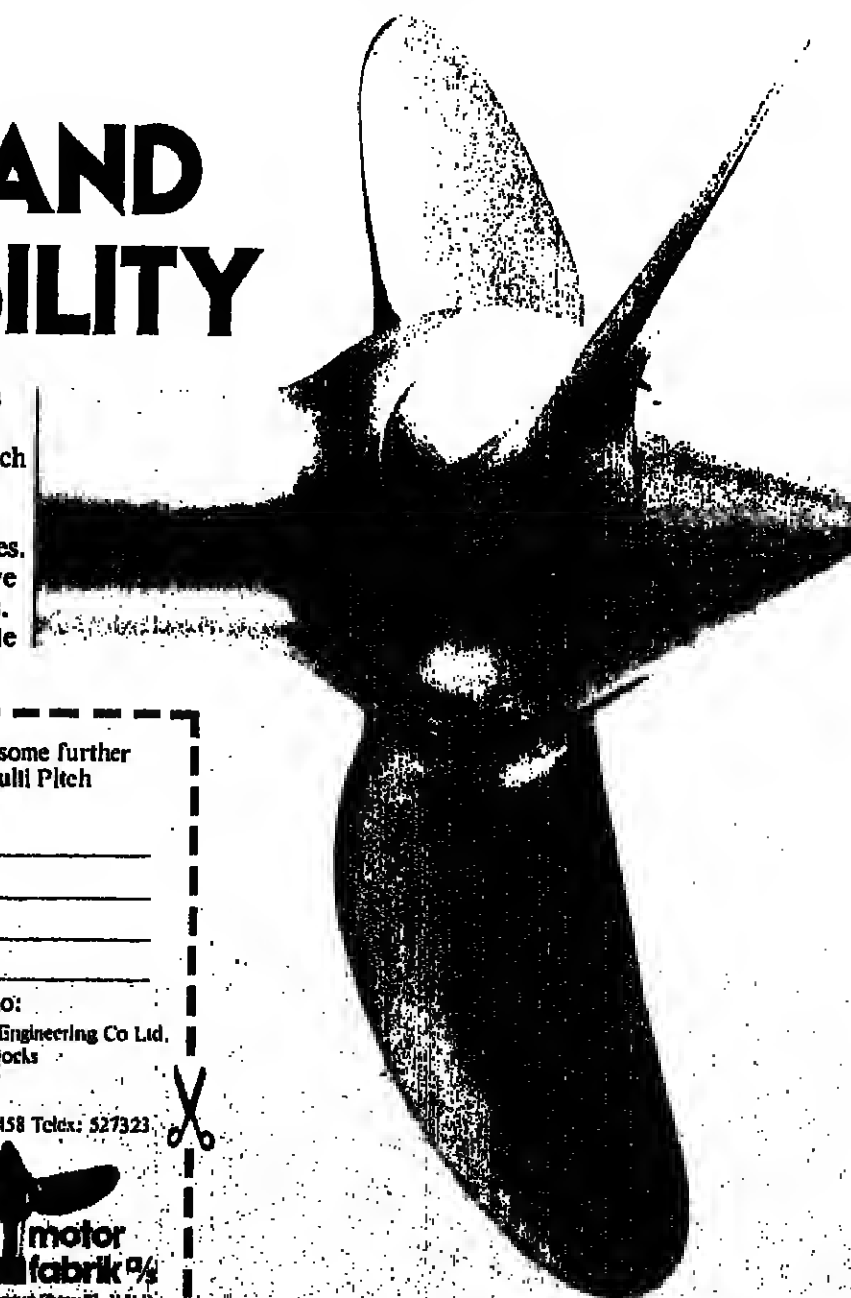
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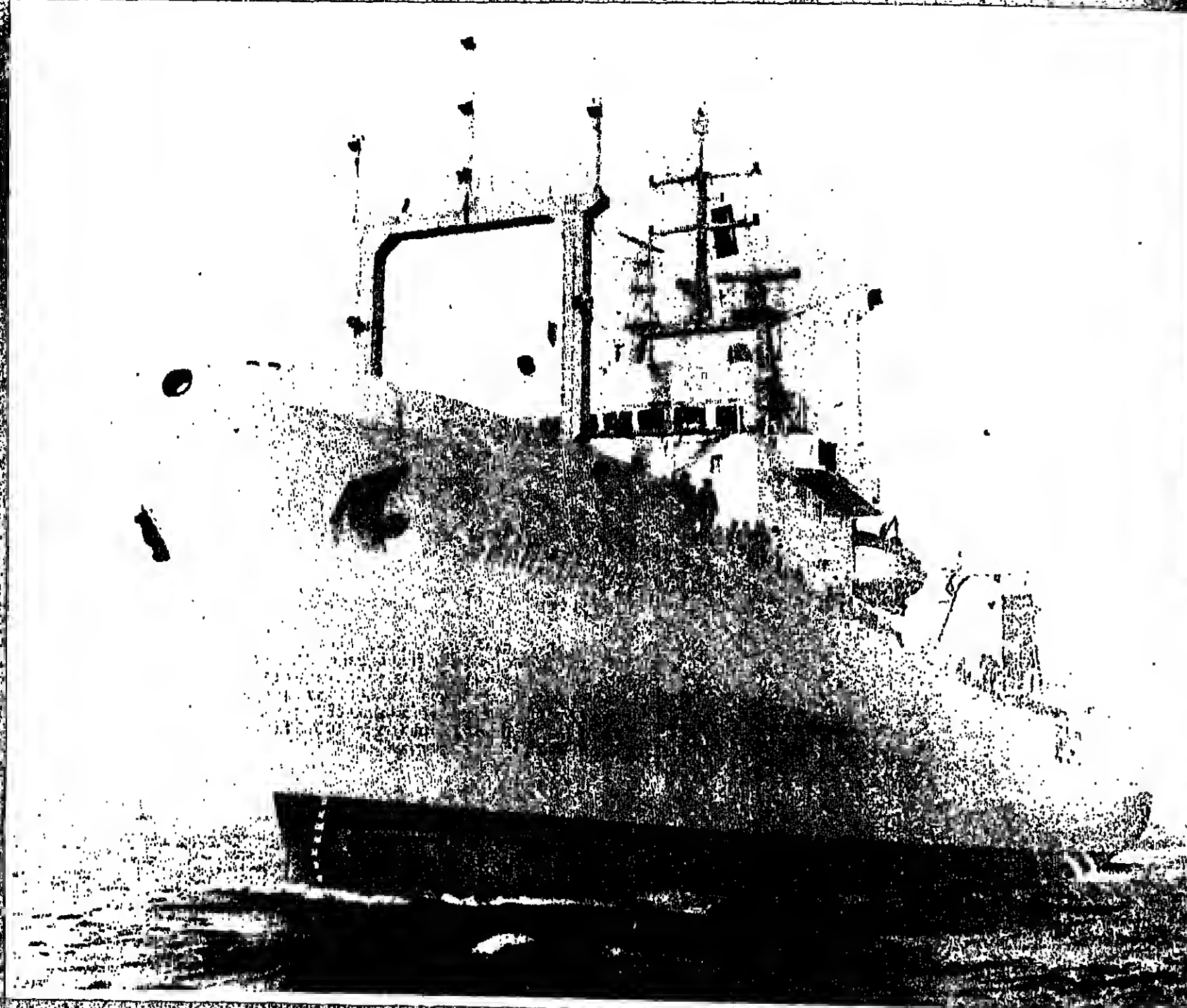
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Can the salmon survive?

THREATS to the survival of the Atlantic salmon (*Salmo salar*) will come under close scrutiny at a big meeting to be held in Edinburgh, Scotland, later this year.

The future of the salmon becomes more precarious year by year, says the Atlantic Salmon Research Trust. Dangers to the fish include the increase in pollution, illegal netting and "continuing disregard of international agreements on salmon fishing regulations by many countries."

With the International Atlantic Salmon Foundation, therefore, it is co-sponsoring an International Symposium. They expect more than 250 people at this "important international" event, which will be on September 26, 27 and 28, and will have the University of Edinburgh as its venue.

This will be the second symposium on the subject; the first was in Canada in 1973.

The three days' sessions of the Edinburgh symposium will begin with a wide-ranging review of the condition of Atlantic salmon stocks in relation to threats to their survival.

Speakers at the sessions will include Sir Richard Levinge and international lawyers who are dealing with the United Nations Conference on the Law of the Sea.

Illegal fishing

Other subjects which will be discussed at the symposium will include the problems of combating illegal fishing, protection of the resource, and the constraints that are limiting the proper use of Atlantic stocks.

Fifteen invited speakers will present papers. They will give the views of the commercial fisherman and the angler; there will be a

Meeting to assess

Atlantic danger signs

substantial section on ecology and another on salmon cultivation, including ocean ranching.

The programme has been arranged to give participants the opportunity for detailed discussions on all aspects of the future of the species.

Accommodation at reasonable rates will be available in the University halls of residence.

Information about this and about the Symposium can be obtained from W. Campbell, Symposium Secretariat, Centre for Industrial Consultancy and Liaison, University of Edinburgh, 16 George Square, Edinburgh EH8 9LD, Scotland.



They come big down on the farm...

One way of ensuring future supplies of Atlantic salmon is to farm it, and this is being done on an increasing scale in several Atlantic countries.

In Norway, for example, the big Mowi project backed by Norsk Hydro produced 680 tons of salmon worth about £2 million in 1977. This was up from 540 tons the year before.

Mowi claims that its salmon competes in favour with the hunted fish. Most of the farm's output is now sold live and not frozen.

Largest venture

Although none of the farm projects in Scotland have yet reached the scale of Mowi, they are growing steadily in number and in size.

Probably the largest venture is that of the Unilever company Marlin Harvest whose Lochinvar brand is being sold throughout Europe.

Here, Marlin Harvest staff show two of the early 1978 crop, fine 17 lb fish, but small compared to some of the crop of salmon up to 27 lb.

Norway expo — why it had to move

THE ORGANISERS of Nor-Fishing 1978 have hit back at critics in Norway of the decision to change the time and venue of this international fishery exhibition.

Nor-Fishing moves this year from its venue in Trondheim to the Sykkylve Centre in Oslo and it will take place in November.

The main reasons for the change are given as the need to maintain the international character of the exhibition and to ensure that it maintains its two-year frequency.

Alternative

"Oslo is the only real alternative if we are to keep our international status," explains Gunnar Skjeggstad, chief executive of Norges Vareselskap, the organising body. The exhibition had, he implied, grown too big for Trondheim.

In 1976 some exhibitors and visitors had to be lodged up to 60 miles from the site. All hotel rooms, boarding houses and hostel beds were taken.

On the site, temporary halls had to be put up at great cost.

Oslo had the halls and the accommodation but things could change in the future, and a committee had been appointed to look into the venue for 1978 Nor-Fishing.

According to Skjeggstad, support so far from manufacturers has been very encouraging. By mid-March more than 200 firms had said they will be taking part in the exhibition.

Chile's tasty new export

THE JUREL is one of the latest additions to the list of fish exports from Chile. A species of jack mackerel, this fish is abundant along the central coast. It is now being frozen and shipped abroad.

Although regarded locally as good-tasting and relatively inexpensive, the jurel has been little exploited. But over the past five years declines in stocks of sardines and merluza (hake) stocks have helped divert attention to other species.

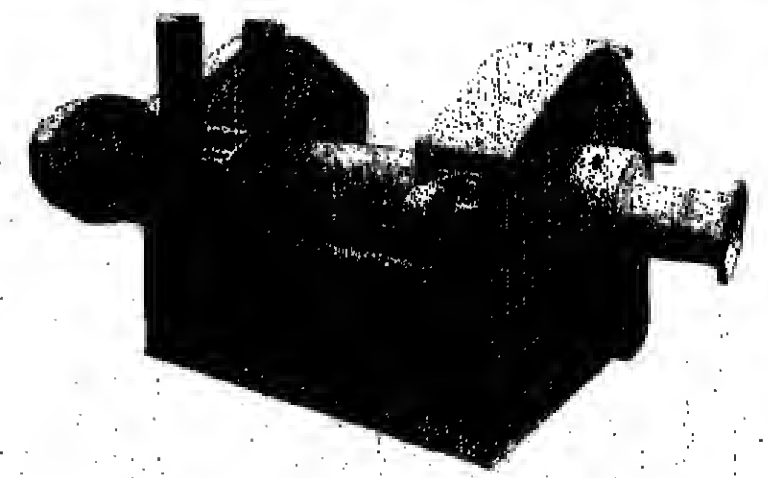
Most of the jurel caught has been going into the meal plants but a start is being made towards increased food use.

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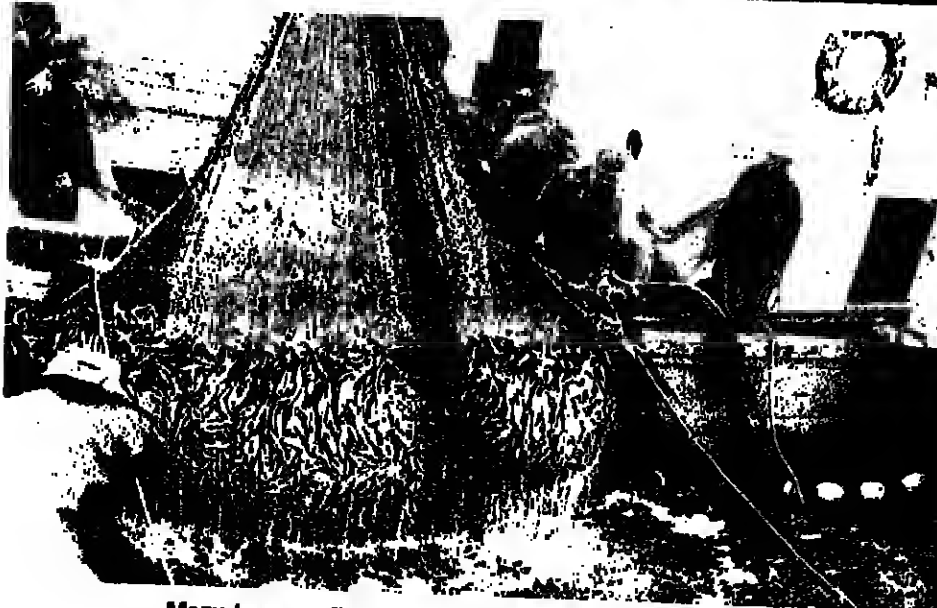
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Wesmar news



Many Japanese fishermen are finding success with WESMAR.

20% more fish in Japan

A JAPANESE purse seiner, the *Daido Maru*, brought in 20 per cent. more fish than most of its competition during 1977, according to its owner, Captain Koike. He attributes this to his new SS160 WESMAR scanning sonar and the superior job it does in locating schools of mackerel and sardines.

"I cannot imagine fishing without the WESMAR sonar," he says. Koike fishes the 15-ton *Daido Maru* and its two searcher boats out of Wajima, Japan. He goes after mackerel and sardines, both of which are difficult to locate because they disperse so quickly if disturbed.

In the past, Koike used an ordinary echo sounder to locate the fish, which made it necessary to go directly over the school. Time and again he disturbed the school and had to scatter beneath him before he could make his set. With the SS160 scanning sonar this no longer happens. The 360 degree automatic sweep and tilt-

able transducer permit Koike to search out schools some distance from the *Daido Maru*. Koike then tracks the school while manoeuvring for the best set. So impressed is Koike with the WESMAR scanning sonar that he predicts every sinner in his class will be using WESMAR within two years.

Already Koike has augmented the SS160 on the *Daido Maru* with two more WESMAR sonars for his search boats. Koike believes this gives him an excellent ability to locate the mackerel and sardines and net the greatest amount of fish possible. His success during 1977 bears him out.



A Japanese fisherman scans with WESMAR sonar.

SPANISH SONAR SEMINAR

IN LINE with the continuing effort to strengthen its service and dealer network, WESMAR recently conducted an intensive technical seminar for its Spanish-speaking dealers. Dealers from Spain, Argentina, Panama, and Mexico sent representatives to Seattle, Washington, for this factory training.

This was another in a series of seminars WESMAR has presented for its dealers in the United States and around the world. Each seminar typically lasts from seven to ten days of intensive technical training. Various aspects of both old and new equipment are treated by WESMAR engineers and technicians. As part of the seminar, practical applications of sonar are demonstrated on WESMAR's test boat. According to the participants in the Spanish seminar, the

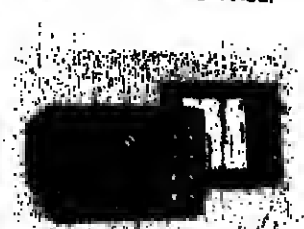


A technical point is explained at a WESMAR seminar.

training was very rewarding. Of particular interest was the technical data on WESMAR's new equipment. The Spanish dealers were impressed with the SS230 low frequency scanning sonar and WESMAR's revolutionary chart recorder. The Spanish dealers believe the information gathered will have an immediate impact on sales and service in their home ports, particularly field service. WESMAR also found the

seminar a valuable occasion to get dealer feedback in its ongoing programme of product improvement.

WESMAR plans to carry on these seminars so that its customers will continue to receive the best service.



The SS230 sonar and R20 chart recorder.

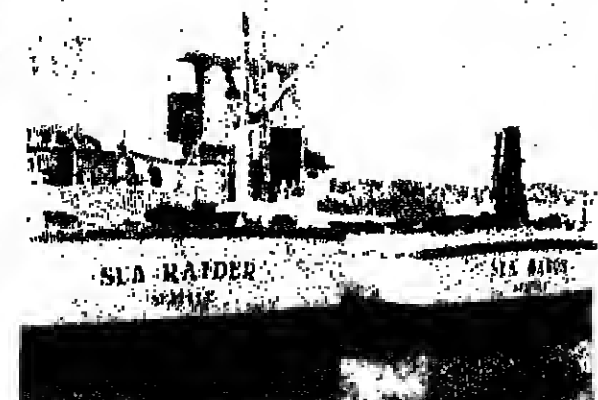
HERRING CATCH TRIPLED

KITSAP Bait Sales, an expanding family-owned business on Puget Sound off the Pacific coast state of Washington, credits two new WESMAR scanning sonars with dramatically increasing its production.

"We've tripled our catch of herring with the sonars," reported Orrin Nelson.

Nelson emphasised that for the business to be a success, every set for herring must count. This is a problem in Puget Sound because the herring are so scattered it is difficult to find a school dense enough to set on.

The Nelsons have solved this problem by using WESMAR scanning sonars on their recently purchased 38-foot Delta Marine seiner *Sea Raider* and *Sea Baron*. "We use the sonars to pick out the areas of greatest herring concentration, then make the set," said Orrin Nelson. By indicating the presence or absence of herring all around the boats, the

The WESMAR-equipped *Sea Raider* and *Sea Baron*.

herring for commercial and sport fishermen. With the WESMAR scanning sonars, the Nelsons find that their total operation is much more productive because they can now find the herring. "The WESMAR scanning sonars took all the guesswork out of our fishing," said Orrin Nelson. Kitsap Bait Sales processes, stores, and freezes bait

SUPERIOR U.K. MACKEREL SHIP

WITH THE use of WESMAR's high frequency sonar, Donald McAlindon, fishing out of Plymouth, England, has made his purse seiner, *Quo Vadis*, one of the most successful mackerel vessels in the UK. Prior to his purchase of the WESMAR scanning sonar, McAlindon found it difficult to locate and track the mackerel. Schools of mackerel are very scattered and difficult to pick up on most sonars.

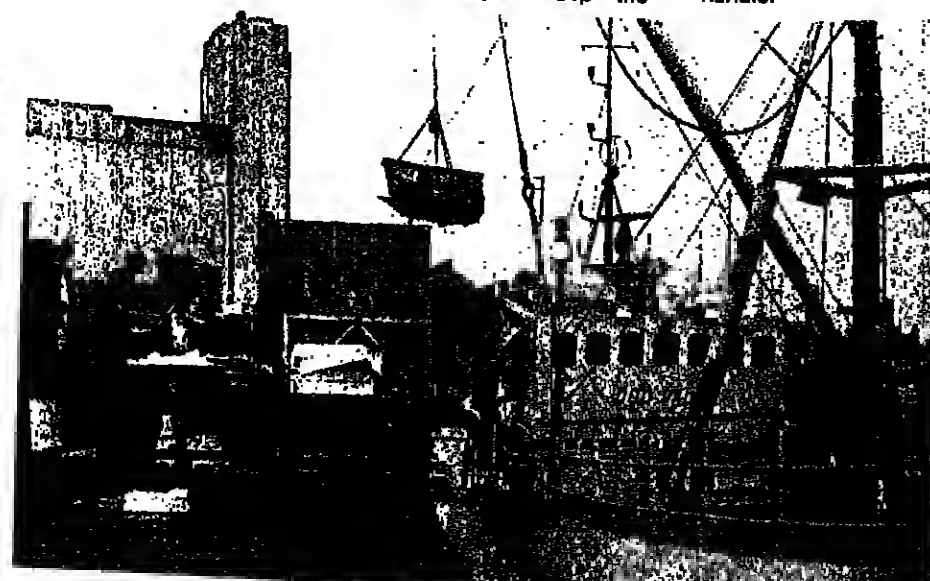
With the installation of the WESMAR sonar, the *Quo Vadis* began to locate and catch the elusive mackerel. The high frequency and

narrow sonar beam of the WESMAR gave detailed resolution of the scattered mackerel. The WESMAR sonar allowed McAlindon to judge the densest concentration of the schools and track its movements to catch the maximum quantity of fish.

The WESMAR sonar automatically scans a 360 degree sweep of any desired sector. This end the tiltable transducer enabled McAlindon to search for the mackerel all around the *Quo Vadis*. WESMAR's patented stabilised transducer helped keep the

sonar on target in rough waters. As important as locating the fish was the ability to successfully haul them aboard. Mackerel are very heavy and too large a load could damage a net. The WESMAR sonar allowed McAlindon to monitor the setting and hauling operations to protect his gear and catch.

After much experience with the sonar, McAlindon was able to calculate the marks on the sonar screen to determine the size of the school. In this way he lost only what his net could handle.

The *Quo Vadis* uses WESMAR sonar to locate mackerel.

Low frequency for long range

WESMAR has introduced its new SS230 low frequency sonar to provide the versatility needed by today's fishermen. Using advanced solid-state technology, the SS230 scans variable ranges up to 5000ft. (1500 metres) all around the boat at any angle in the water. Fishermen report shallow

water detection of medium sized schools of fish up to 800 metres with significantly longer range detection of large schools in good conditions.

Three modes of display help locate and track fish schools or define bottom contours. A depth range computer gives instant

digital readouts of distance to underwater targets. The targets displayed on the SS230's CRT screen are also recorded by the chart recorder, which is standard with the SS230. WESMAR's patented stabilised transducer keeps the sonar on target in rougher waters.

NORWAY—the limits issue

SPITZBERGEN DISPUTE GOES ON AND ON...

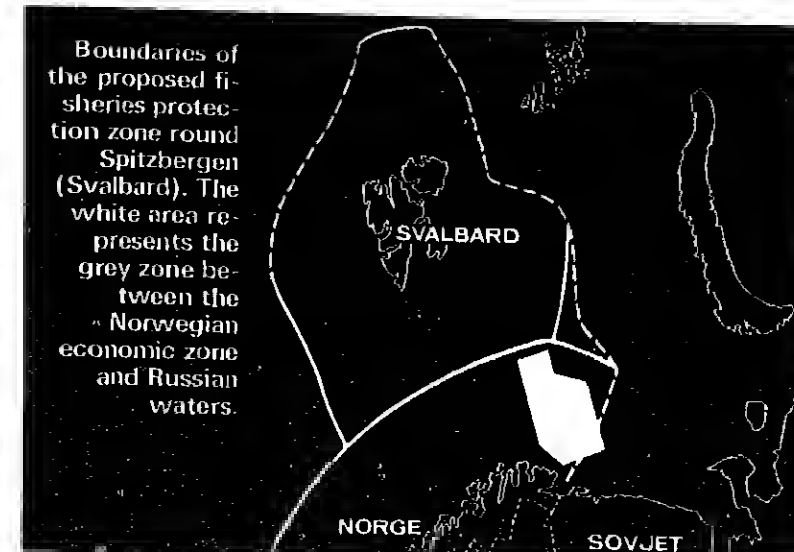
NORWAY'S proposed fisheries protection zone round Spitzbergen (Svalbard) was discussed in Moscow in March between Norwegian Law of the Sea Minister Jens Evensen and USSR Fisheries Minister Alexander Ishkov.

Earlier this year the purpose and operation of the zone were explained in talks in western capitals including Bonn, Brussels, London, Paris and Washington.

Governments in the west appear generally to accept the Norwegian proposals, but East European governments have lodged protests in Oslo. Protesting countries include the USSR and Poland and also Bulgaria, Hungary and Czechoslovakia.

Norway wants a protection zone round Spitzbergen to avoid any stepping-up of fishing there to compensate for reduced quotas within the 200-mile economic zone. Much of the fish around Spitzbergen is young immature cod which should be protected to ensure future stocks.

Apart from restrictions on catching generally in the Spitzbergen area, the Norwegian government proposes the creation of two special "boxes" where trawling would be banned



completely while catching by other forms of gear would be permitted.

The idea is that the protection zone generally will be operated on a non-discriminatory basis. But the two no-trawl areas have been criticised as representing discrimination against countries exclusively engaged in trawling.

Norway already requires fishing vessels to report their arrival in the Spitzbergen zone, but East European countries have so far ignored this instruction.

The Norwegians also want to

inspect vessels operating in the zone to ensure that NEAFC rules for mesh width and minimum size of fish are observed.

Russian agreement is considered vital if the protection zone is to be effective.

In Oslo, the Norwegian Parliament approved by a small majority the provisional agreement concluded with USSR establishing a grey zone in the disputed area in the Barents Sea between the Norwegian and Soviet economic zones. Voting was 65 for and 61 against.

Computer check on foreign fishing

DETAILS of the 736 foreign vessels permitted to fish this year in the Norwegian 200-mile limit are now stored in a computer in the Fisheries Directorate, Bergen.

The computer is linked to four terminals along the coast, and there is a flow of data to and from ships in the coastguard fleet. Basic data is registered as applications come in. During fishing, foreign vessels have to report catches each week. If they do not do this they risk losing their licences.

Data analysed

Information in the weekly reports is analysed. Observations by coastguard ships and aircraft are constantly checked against computer records. Thus, before landing or boarding a ship, the coastguard service can obtain preliminary information such as the name of the skipper, how much the vessel may catch, and how much catch she has reported.

The system set up by the Directorate is reported to be working so well, that the techniques have now been sold to Sweden.

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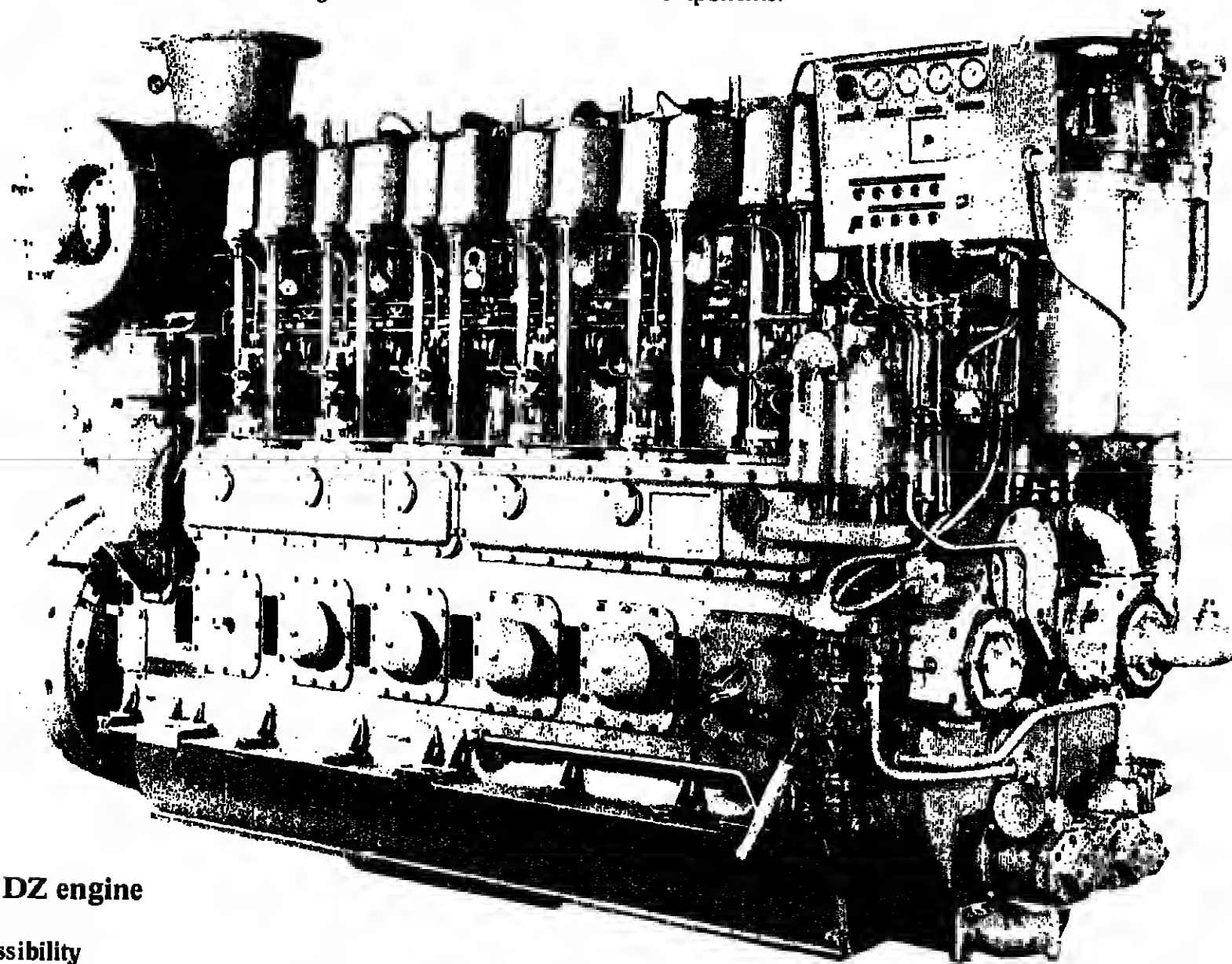
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from the dockside by PETER HJUL

THE Japanese are roaming far and searching wide to find fish that may still be available to help them replace the Alaska pollack they have lost in the North Pacific. As we pointed out last month, this fish (nintai to the Russians and walleye pollack to the Americans) yielded a total catch in 1976 of just over five million tons. It is a gadoid related to the cod, the hake and the haddock.

Americans who had their market flooded by Japanese-exported frozen pollack a few years ago found the fish inferior to its cousins, in taste and keeping qualities. But that may have been due to the fact that the industry in Japan is more familiar with converting pollack into surimi.

This substance can be loosely described as a form of minced fish. But, as a Japanese participant told the FAO Products Conference in Tokyo in December 1973, it comes from a process more sophisticated than a whirl through a Baader or a Bibun flesh separator.

It is produced in several intricate stages. When these are done, the surimi is the raw material for fish sausages or the ingredient of various Japanese delicacies known as kamoboko.

At that same conference, I remember two splendid parties where the tables groaned with delectable versions of kamoboko.

Those, of course, were the heydays of Japan's pollack fishery, with great stern trawlers up to 5,000 tons working the high seas and supplementing the more traditional shore-based fisheries from Hokkaido and north Honshu. In 1973, Japan had three million tons of a 4.6 m. ton catch. In 1976, the share was down to less than 2.5 m. tons.

Forced out

By 1977, the Japanese had been forced out by Russian and American 200-mile limits from their best pollack areas. I have not yet heard the final figure, but it must have been well below two million tons; for the surimi industry and its thousands of fishermen and other workers this means disaster.

It was not unexpected, however, and the fishing giants such as Taiyo and Nippon Suisan began their search years ago. We report one result elsewhere in this issue. A Japanese consortium has done a deal with the Argentinian government for a test venture off Patagonia.

Hake is the main fish involved, but I hope the consortium has more success with it than one of the member companies, Taiyo, had with a related fish off Peru.

In 1974, in co-operation with the Peruvian state corporation EPSEP, Taiyo and two other Japanese companies formed a joint venture company known as Challwa del Peru.

The project was intended to catch and process hake into sausages and other products for sale locally, and for surimi to be sent to Japan.

But it was found that the Peruvian merluza or hake is periodically afflicted by enzymic action that breaks down the muscle structure of the dead fish, particularly when the temperature is raised.

Black spots

This is a complex problem experienced in several hake fisheries. It is associated with black spots in the flesh and may be partly attributable to some parasite. When I visited the North-west Center in Seattle of the National Marine Fisheries Service in October last year, it was being investigated by John Dassow and other workers.

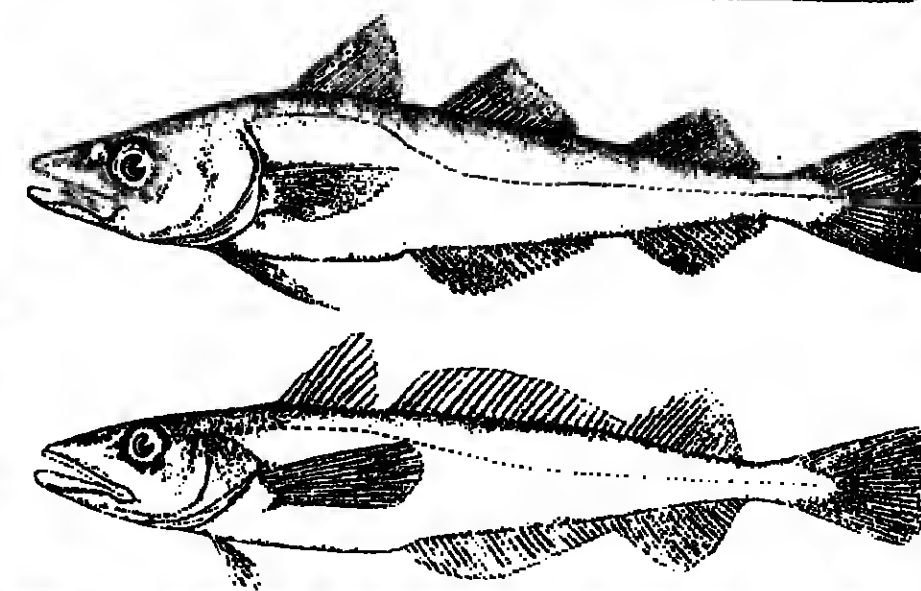
But Taiyo and its associates are not waiting. They are closing their Peru venture and withdrawing their investments from the country.

Hake is not the only fish being looked at. The blue whiting or poutassou, a smaller gadoid, might also be a pollack substitute.

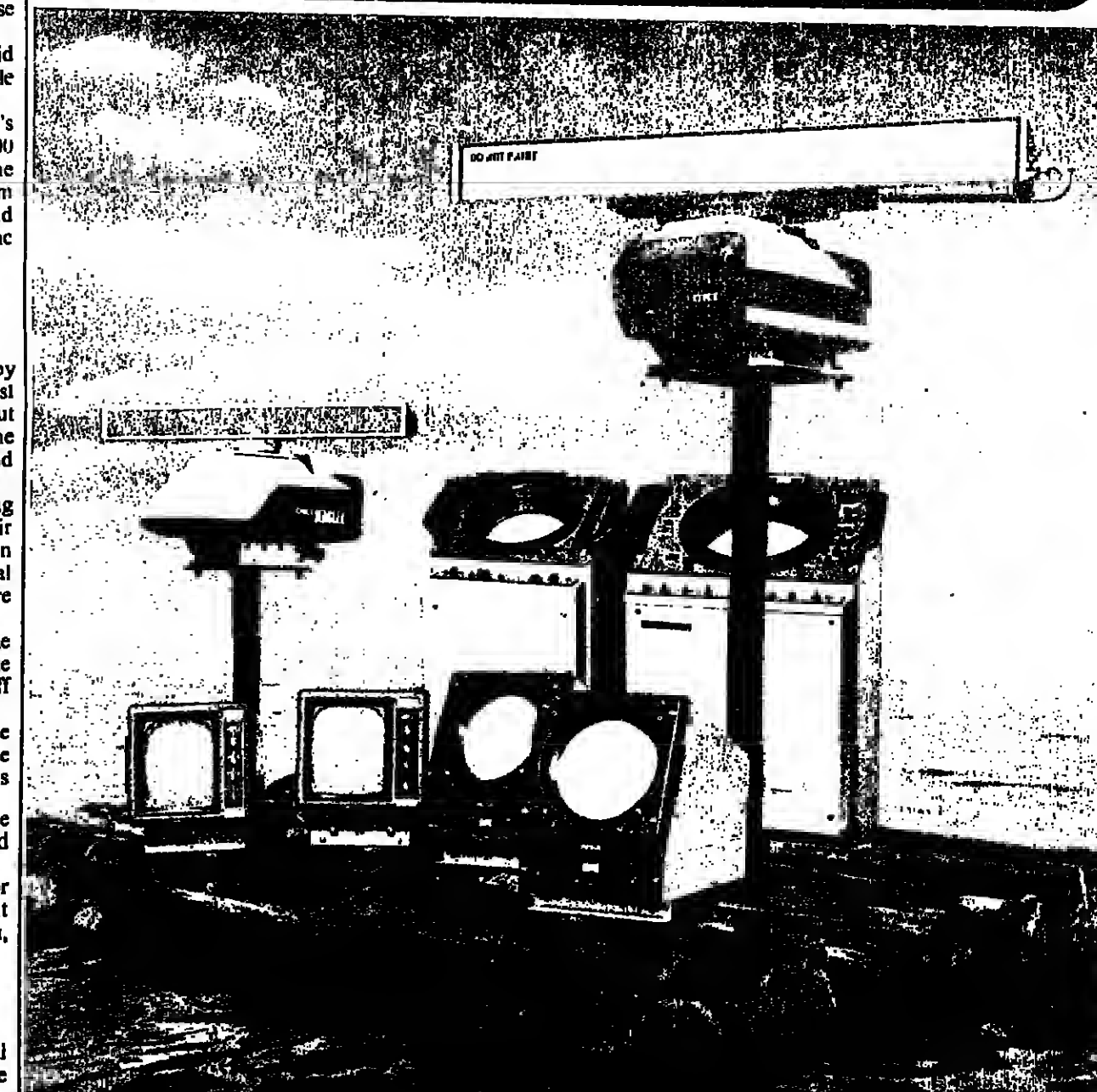
The British, the Norwegians and others have been trying to exploit the big stocks which concentrate west of the British Isles in the spring.

Next month, a factory on Shetland will give the Japanese a chance to turn the fish into surimi. A test machine is being installed and it will be tried out on part of the catch taken by the continuing experiment that has been long in progress.

Perhaps it may at last reveal a substantial food use for the million tons of blue whiting said to be catchable.



Related but so different! To offset the sharp drop in supplies of Alaska pollack for surimi, the Japanese are looking at other gadoids, such as the Pacific hake (lower picture). But they are finding the pollack is not easy to replace.



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HE-10700	2½:1, 3:1, 3½:1, 4:1		
HY-22000	1:1, 1½:1, 2:1	Cummins VTA-903M, Detroit Diesel 8V-92 Marecoda OM403-404, Scania DSI 14	
HY-8900	1½:1, 2:1, 2½:1, 3:1**		
HY-7700	3:1, 4:1, 4½:1	Allis Chalmers 25000 Caterpillar D343, 340B, 340B Cummins NTA855M, KT-1150M Detroit Diesel 8V71, 8V92, 12V71	
HY-28000	4½:1, 5:1, 6:1	Rolls Royce C8M-310, C8M-410 Scania DSI-11, DSI-14 Volvo TAMD120A Waukasha H868DSIM, F874DSIM	
HP-8900	1½:1, 2:1	Detroit Diesel 12V71T1*	
HP-7700	3:1, 4:1	Caterpillar 3412TA Cummins VT1710M, KTA1150M Detroit Diesel 16V71 Rolls Royce, DV8NM, DV8TM	
HP-28000	4½:1, 5:1, 6:1		
HPV-9400 HPI-9400	1:1, 1½:1, 2:1, 3:1	Caterpillar D353TA Cummins VTA1710M, KT2300M Detroit Diesel 18V-92, 12V-149 Rolls Royce DV8TCWM Waukasha F2898DSIM	
HPV-10500 HPI-10500	4:1, 5:1, 6:1		

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5HD-200	1:1 in-line	Cummins VT903, N855M, Scania D14, Caterpillar 330B, Volvo TMD-100A, Detroit Diesel 8V-71, Rolls Royce C6M265
HY-400	1:1 in-line	Detroit Diesel 8V92, 12V71, Scania DSI-14, Cummins VTA-903M, NTA 855M, KT1150M, Caterpillar 340B, Rolls Royce C8M410
HP-500	1:1 in-line	Detroit Diesel 12V71T1 Caterpillar 3412TA Cummins KTA1150M
HR-200	1:1 in-line	Caterpillar D398, D399 Waukasha F2898DSIM

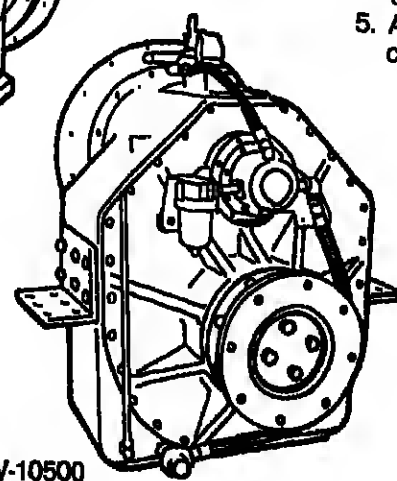
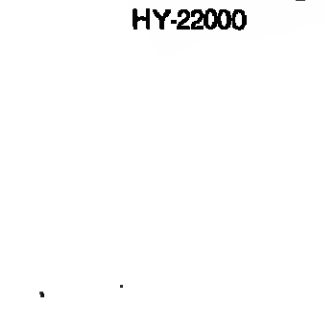
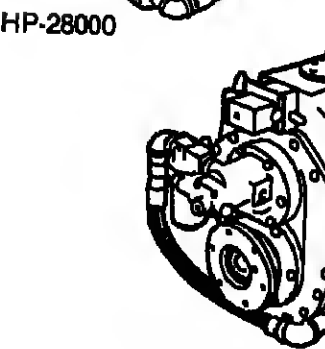
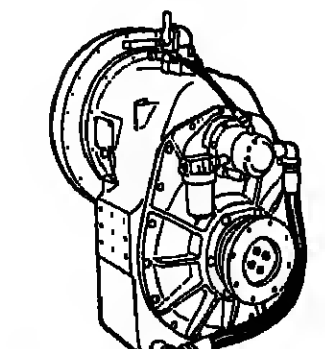
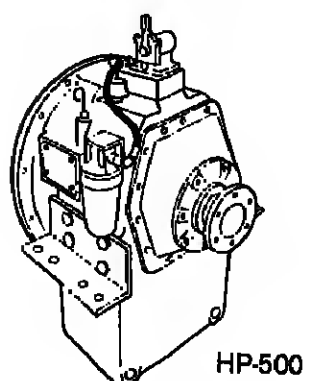
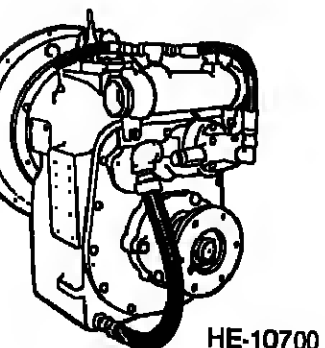
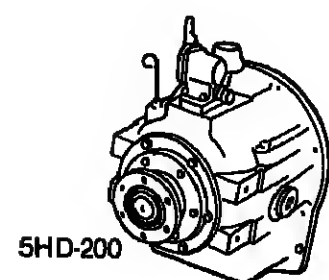
- Notes: 1. Consult factory or authorized distributor on specific applications. This chart is intended as a guide only.
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EEC and Norway decide Cut cod catch, Iceland warned on this year's quotas

A QUOTA agreement for 1978 was signed last month by the European Economic Community and Norway in Brussels.

Under its terms, EEC fishermen will be allowed a total of 421,000 tons from the Norwegian economic zone and Norwegian fishermen 322,700 tons from the EEC zone.

In addition, EEC fishermen will be able to fish for blue whiting in the Norwegian zone without restriction. And Norwegian fishermen will be able to fish for blue whiting and porbeagle shark in EEC waters. The Norwegian catch of blue whiting in 1977 was 38,753 tons.

The 1978 agreement, said Norwegian Fisheries Director Knut Vardal, does not prejudice the quotas to be fixed in subsequent years. The aim is still to establish a balance in quotas by 1982. He saw the 1978 agreement as a step in this direction. EEC

fishermen caught 547,000 tons in the Norwegian zone in 1976 and 529,000 tons in 1977. The 1978 quota is therefore a considerable reduction.

In the EEC zone, Norwegian fishermen caught 329,000 tons in 1976 and only 128,000 tons in 1977.

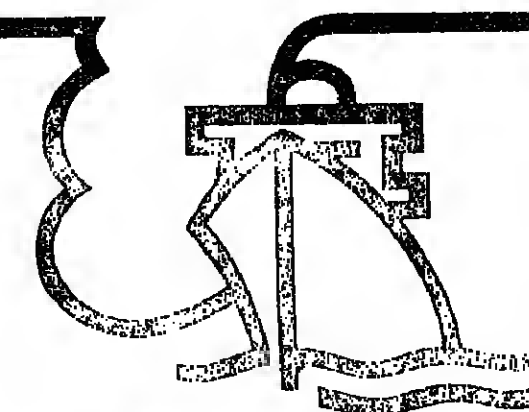
The 1978 agreement was delayed partly by the failure of the EEC countries to agree on their Common Fisheries Policy, and partly because of EEC reservations over Norway's decision to establish a protection zone around the Spitzbergen islands.

HAKE SURVEY DEAL SIGNED

A CONSORTIUM of five leading fishing companies in Japan has finally agreed with the Argentine government over a test fishing operation for hake in the waters off Patagonia. The contract was signed in February.

The five companies are Nippon, Suisan, Taiyo, Nichiro, Kyokyo and Hoku. Two 3,000-ton stern trawlers are being sent by the consortium to man the venture. The target is a catch of 100,000 tons.

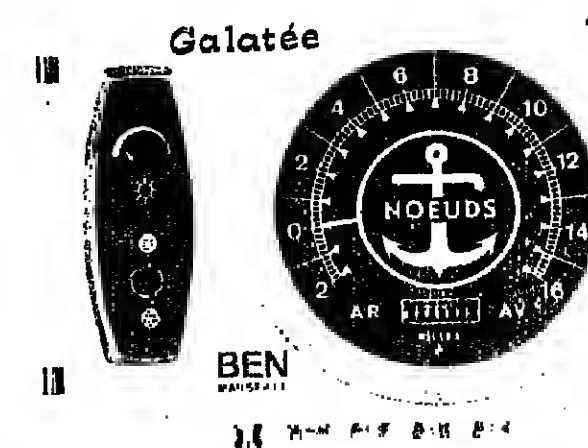
If the test succeeds, the Argentine government will establish a hake fishing company together with the Japanese members of the consortium.



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Sinkings start safety row

RECENT SINKINGS of fishing boats off Norway have sparked off a long-simmering row over vessel safety and the responsibility for enforcing it.

The boats lost included the *Fritz Erik* and the 75 ft. *Urvik* Senior which sank off Senja with the loss of her nine crew. The wooden boat was built in 1964.

When Modolv Hareide of the Norwegian Shipping Directorate alleged that the Fishermen's Association had resisted efforts to increase vessel safety, Association chairman John J. Toft retorted with a vigorous denial.

The Association, he said, had made continuous efforts to improve vessel safety, and that there are few boats that

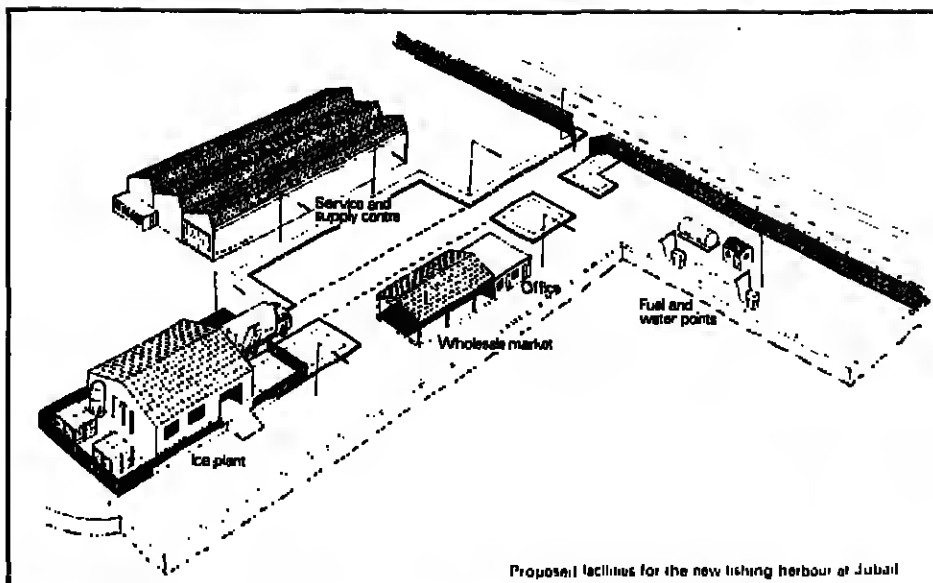
have shown less interest than the Shipping Directorate.

But the Directorate then claimed that fishing boat safety was under constant surveillance. It had its own fisheries adviser and the Fishermen's Association was represented on its advisory council.

To try and settle the dispute, the Association and other organisations were invited to meet the Directorate in Oslo at the end of March. The matter is also on the agenda for discussion at the Association's national conference this month.

According to a spokesman of the Fisheries College in Trondheim, many of Norway's 19,000 fishing vessels are old and fail to satisfy the rules for stability introduced ten years ago.

SAUDI ARABIA PORT PLANS



The WFA plan for the layout of a proposed new harbour at Jubail, on the Persian Gulf coast of Saudi Arabia.

AS PART of the four-year research and development project it is carrying out for the government of Saudi Arabia, the British White Fish Authority has been looking at fishing harbours and supply centres, and has introduced the research vessel *Ibn Majed*.

Harbour and shore facilities for fishermen on both the Gulf and Red Sea coasts of Saudi Arabia are "minimal and would not be able to support a modern fishery," says the WFA in its report on work in 1977, the second year of the project.

Centres which will play an important part in the future Saudi fishing industry include Jubail, Tarrut Island, Jeddah, Gizan and Tuwwal.

At Jubail on the Gulf coast, the Port Authority is building a new fishing port. It will have a 300-metre long quay and 60,000 sq. m. of land for discharging and servicing the boats.

But the project does not provide for other needs such as fuelling and freshwater berths, repair and maintenance shops, slipway, a market, ice plant and administration offices.

The WFA has, therefore, drawn up a plan (see drawing) incorporating these facilities.

At Gizan, the most active Saudi fishing port on the Red Sea, there are plans for a new market. The WFA now believes it could also be developed into a modern harbour through reclaiming land on the foreshore and providing a proper fish landing area.

Jeddah's need is for an improved market. At Tuwwal (a Red Sea fishing village) fishermen have to wade out to their boats. The WFA has recommended that it be developed as a fishing centre by providing a simple concrete jetty 50 metres long by 7 m. wide.

Research ship

In the year since she has been in service, the *Ibn Majed* has carried out several survey and exploratory fishing projects. These include work leading to the discovery of new grounds in the southern Red Sea and testing longline fishing.

The *Ibn Majed* (formerly

WFA reviews second year of £7m. project

named the *Akula*, see *ENI* February 1977) was one of six vessels ordered from the Astilleros Zamacoia yard in Bilbao, Spain, for deep-sea shrimping off Angola.

She was adapted for her new role on the stocks in Spain and later in Britain where the WFA developed the ship into what it has described in the report "as one of the most advanced vessels of its type".

She is also a remarkable bargain for the £7 million Saudi Arabian project. Instead of ship built from the keel up at a cost of £1.5 to £2 million and delivered in two years, the project got the ship it needed in less than a year for £800,000.

She is, says the WFA, "superbly equipped and extremely versatile. Not only can she undertake bottom trawling, mid-water trawling and purse seining, but other methods such as gill netting, longlining and trap fishing."

The *Ibn Majed* is 31.5 metres long overall with a moulded breadth of 8.3 m. The fish hold has a capacity of 40 cu. m. The ship is powered by a Caterpillar D398-B engine of 850 hp.



Tests of a new-design small boat (see Page 36) and the development of resources and harbours will lead to the replacement of old traditional craft, such as this Gulf fishing dhow.

TAMIL NADU GOES SHRIMPING

THE Tamil Nadu Fisheries Development Corporation is to move into India's shrimp export trade soon under its own brand name. The state's Minister of Food, Mr. G. R. Edmund, said the Corporation had just acquired two 23-metre long shrimp trawlers built by the Imesa yard in Mexico. They had cost Rs 8 million (about £510,000). If they succeeded, other similar boats would be bought.

Each voyage of the trawlers will last about ten days and they will make about 20 trips a year.

According to Mr. Edmund, the Tamil Nadu government is also considering proposals for the replacement of many of the state's 42,000 traditional fishing boats with GRP-hull boats powered by outboard motors.

These engines are not manufactured in India and so they will be imported from Japan at prices from Rs 4,000 to Rs 6,000 each. It is planned to start with 200 engines, and then to bring in about 400 a year.

Malta seeks trawlers from Arabs

THE GOVERNMENT of Malta has ambitious plans for the island's tiny fishing industry, and it is to be developed with the help of several Arab countries. Libya is taking part in a joint venture through a co-operative called Stad u Stana (Fish and Get Rich).

This was announced by Prime Minister Dom Mintoff, but few other details have been given out except that some ten small trawlers will be operated and these are to be built in Malta.

In the Maltese budget for 1978/79 revealed last month, about £M1.76 (2 million sterling) has been allocated for agriculture and fisheries. Of this, £570,000 will be used to acquire trawlers and to train crews to work them.

Another six trawlers are expected from Kuwait and Saudi Arabia.

In recent years, the number of fishermen in Malta has increased from around 750 to nearly 1,000.

But the bright picture of development and fishing progress painted by Fisheries Minister D. Cremona is contradicted by the Opposition in the Maltese Parliament.

Speaking during the budget debate L. Gatt, shadow Minister for Fisheries, criticised the state of the island's fishing harbours, and the way fishermen were being assisted.

He said that catches in 1977 had fallen by 5.6 per cent. He was also critical about the plan to use trawlers on the limited resources around Malta.

FAO, he pointed out, had indicated after its survey that two trawlers would be enough to supply Malta's needs.

Cuba develops fish exports

IN AN effort to diversify her exports, Cuba has been developing the production of the fishing industry.

Twenty years ago fishery exports earned Cuba the equivalent of US\$4.5 million; in 1977 earnings had jumped to \$84 million, and production is expected to rise by about 35 per cent to 1978 as a number of new ships come into operation.

Yearly landings have reached about 200,000 tons. Domestic consumption during 1977 was estimated at 12.3 kilos a head.

Exports are mainly of high-value species such as spiny lobsters and shrimp.

Fish production will increase as ships, such as the super-trawlers built in Spain (see *ENI*, March 1978), come into full operation in distant waters.



Threatened by trawlers? The picturesque traditional Maltese luzzu in Marsaxlokk, the island's main fishing harbour.

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NORDSEE LOOKS TO CANADA

Newfoundland offer by German giant

THE OFFER by West Germany's big Nordsee trawling and fish processing company for a controlling share in a Newfoundland fish factory sparked off a lively argument in the Canadian province. Federal government officials are also watching the progress of the application, reports our correspondent.

Bremerhaven-based Nordsee is a company in the giant Unilever group. Another company in the group, Britain's Birds Eye Foods, invested in a Canadian east coast venture some years ago, but later pulled out.

The offer is for a 51 per cent interest in Ocean

Harvesters of Harbour Grace. Nordsee says it is prepared to invest \$10 million in ships and cash. Three deepwater trawler and freezer ships would be included in the deal.

Saying it supports the offer, the Newfoundland government has pointed to a number of benefits. With Nordsee backing, the Newfoundland company would probably be able to offer year-round employment for 450 workers. And there could be an end to the glut dumping of fish caught by the inshore fishermen in the summer months.

It will probably also have been noted that Nordsee is one of the more efficient and competently run of Western Europe's big fish-

One of six ships built for the Nordsee fleet in the early 1970s; this 82 metre long factory trawler can handle more than 100 tons of fish a day.



Spain pleads hardship in cod quest

SPAIN, one of the countries hardest hit by Canada's 200-mile fisheries zone, has been negotiating for an increase in its cod quota. Canada appears to be ready to accommodate the Spaniards but wants increased access to Spanish markets for her fish products.

Quiet negotiations between officials of the two countries received some public attention during the state visit of Jules Leger, Canada's governor-general, to Spain in mid-March. He was briefed by Canadian officials before his departure and heard further representations from the Spanish government, reports FNI correspondent Alex Binkley from Ottawa.

In 1974, Spain had a total quota of 204,500 metric tons in the ICNAF area off Canada. By 1976 the quota had been cut to 14,600 tons for the same area.

Spain has pleaded hardship, a claim Canada recognises because of the importance of cod in the Spanish diet. Officials say that Spain has made the situation difficult for herself by showing little interest in catching less popular species, a transition made readily by the Soviet Union.

A Canadian official says the government might grant a quota increase of 2,000 to 3,000 tons but it would be closely tied to additional markets for fisheries products in Spain.

Earlier, the Spanish hinted they might violate international guidelines and fish for as much North-west Atlantic cod as could be caught

outside Canada's zone. This move would infuriate Canada which says that fishing outside the zone must parallel levels on the inside to prevent a disruption of stock regrowth.

But the Spanish have dropped their overfishing threat, officials say, in light of Canada's preparedness to discuss a quota increase.

The Spanish quota was heavily cut because much of their cod fishing had traditionally been in areas on the Grand Banks and north of Newfoundland where the stocks had been most heavily depleted by overfishing.

Spain, a traditional big fish consumer, has also had her fishing options severely reduced in the European Economic Community fisheries zone as well as in direct off Africa.

• MORE THAN 340,000 tons of fish and shellfish were caught in Argentine waters during 1977, according to the Argentine Ministry.

This catch is 25 per cent higher than the two previous best years of 1976 and 1975. Of the total, 265,000 tons were processed as frozen fish and fillets for export, which resulted in a net 150,000 tons

New deal means trawlers may return

SPANISH trawlers have also been barred from a once-traditional fishing area — off Mauritania. During 1977 several vessels were arrested for fishing there illegally.

Now they may return, under controls, as the result of an agreement which will licence them for operations inside the Mauritanian 200-mile limit.

The agreement also provides that Banco Exterior de España, will lend Mauritania the US\$20 million for the purchase of ships and other equipment from Spain.

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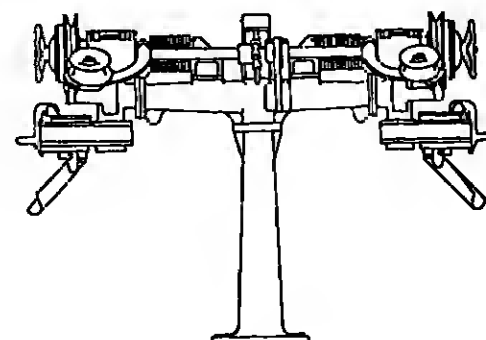
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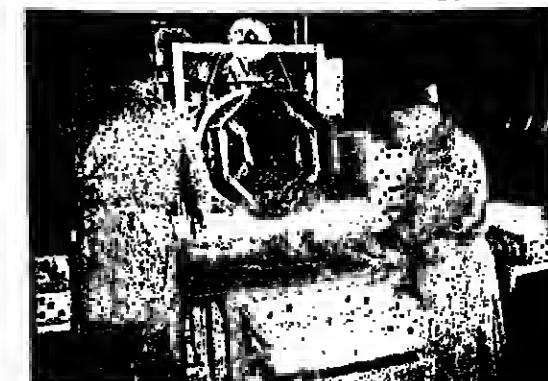
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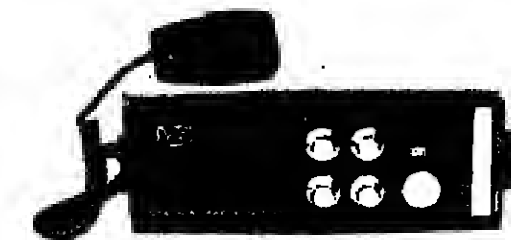
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Licence warning to boat buyers

CANADA'S Minister of Fisheries Romeo LeBlanc has warned prospective buyers of boats to check first whether the purchase goes with a licence to fish.

"Buyers should not assume that fishing licences will be automatically re-issued," he said. "When a vessel is sold its licence becomes invalid and an application for a new licence must be made by the new owner."

The policy of the Federal Fisheries Department was to encourage the ownership of fishing craft by individuals or fish catching enterprises rather than by processing companies. "In view of this, any attempt by a company to increase the size of its existing fleet would certainly be resisted."

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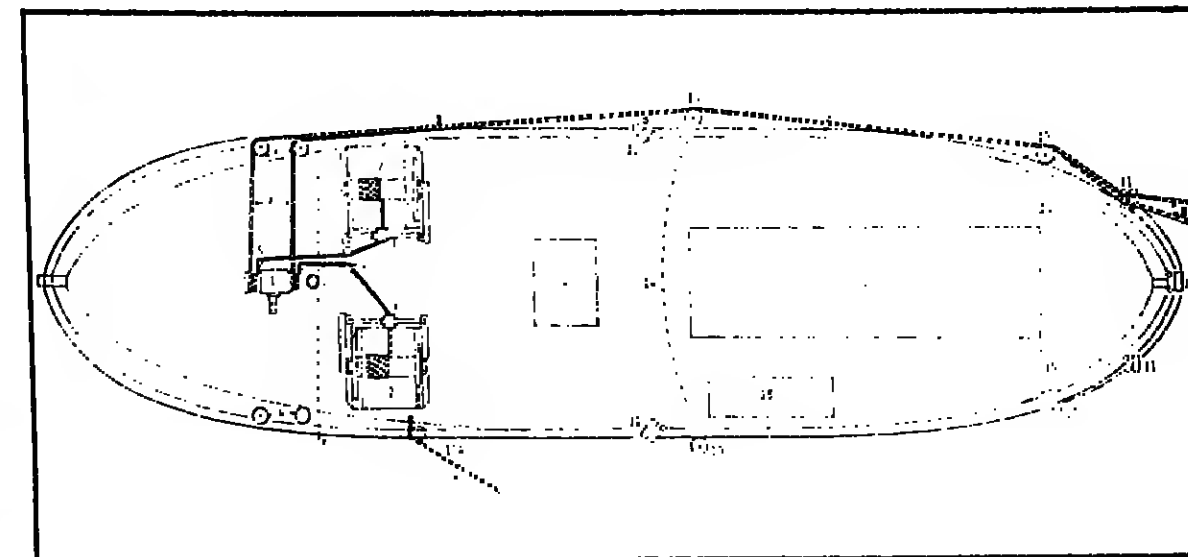
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Deck layout of the *Nivea* after she had been fitted out for Scottish seining. 1. Saine winch 2. Rope drums 3. Spooling gear 4. Guide blocks 5. Guide rollers 6. Mast 7. After edge of raised forecastle 8. Saine rope running aft 9. Hatch 10. Vertical guide roller 10a. Vertical guide rollers for setting of rope 11. Heuling in rollers for seine rope 12. Aft superstructure 13. Auxiliary engine 14 and 15. Forward and aft edges of superstructure.

The *Nivea* has a crew of five and is a wooden hull vessel 23.4 metres long. She is powered by a 400 hp engine.



Norwegian boat tries out Scottish seine netting

A SERIES of tests by the Institute of Fisheries Technology Research could lead the adoption of the Scottish method of seine netting by Norwegian fishermen working the open seas.

Up to now, the seine netting technique for taking high quality catches of demersal fish has been used by the Norwegians only in shallow-water inshore areas around the Lofoten Islands and off Finnmark. But they have been impressed by the success of Scottish seine net boats working in deeper waters off Norway.

The Institute says that the Norwegian sector of the North Sea is particularly suitable for seine netting. Until tighter controls following the introduction of the 200-mile limit, more than 200 Scottish seine netters are said to have operated in this sector.

Auxiliary engine

Test seining with "flyshoot-ing" gear has been carried out since 1976 from the 78 ft. (23.4 metre) wooden boat *Nivea*. Powered by a 400 hp engine, the boat has a crew of five.

The *Nivea* is equipped with Norwegian hydraulic rope drums and a Scottish-made seine net winch plus guide rollers for the ropes. An auxiliary 110 hp engine was fitted to provide power for the high-pressure hydraulic system.

Tests showed that, by using

drums for storing the seine rope (a method widely adopted by Scottish owners), it was possible to drift with much longer rope lengths than in the inshore seining. This, says the Institute, opens possibilities for seining at greater depths and further out to sea than has been usual in Norway.

Less wear on ropes

Because they avoid kinking, the drums also reduce wear on the ropes.

Through experience during the tests, the Scottish-style rigging was modified so that the ropes are guided overboard while setting to leave an open, and safe, working deck.

Deck machinery is controlled from the wheelhouse, leaving the crew free to concentrate on fish handling.

Small haddock made up much of the North Sea catch and gutting proved to be a huge task until a suitable machine was installed.

Reporting recently in the official journal *Fiskegagning*, the Institute says that, while North Sea prospects for deepwater seining appear to be good, possibilities to the Barents Sea are "still an open question."

Technically, it was possible to fish with seine nets at depths down to about 200 fathoms where the bottom was even and not too stony or soft. But further work is needed to adapt equipment for such depths.

In the North Sea fishing was at around 40 fathoms, with 1,520 fathoms of rope on either side of the seine net.



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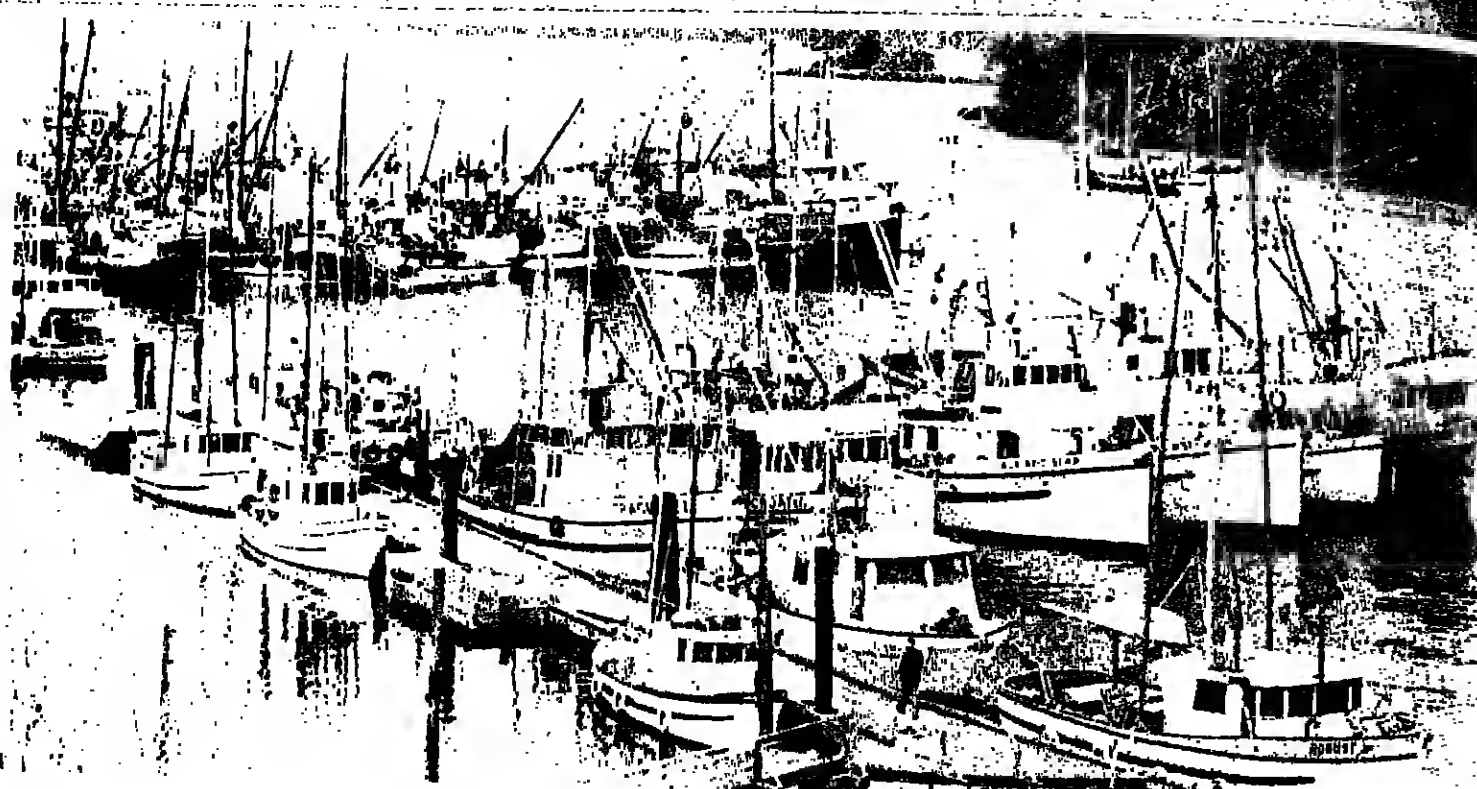
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Fishing boats in Ucluelet, British Columbia, after busy season fishing for roe herring. The short-lived fishery provides work for 6,000 fishermen and 3,500 tendermen and shore workers, and earns about \$40 million for the Province. The main catching area is off the west coast of Vancouver Island. The main outlet for the fishery is the Japanese market for roe herring. But, with the shortage of herring in Europe, attempts are now being made to sell the Pacific fish in Britain, Holland and other European countries.



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A HECTIC MONTH FOR THE ROE FISHERY

IMPORTANT as salmon are to the British Columbia industry, the focus in March was on another species.

The 1978 roe-herring fishery, which began its short run on March 1, provides brisk work for 6,000 fishermen and 3,500 tendermen and shore workers. It earns about \$40 million.

It began in 1970 when a market was opened for the roe in Japan. The permitted catch then was 11,000 tons, following a conservation close-down of Pacific herring fishing.

This year, the quota is 82,000 tons, with 49,000 tons going to the purse seiners and 30,050 tons to the gillnetters. The main catching area is off the west coast of Vancouver Island.

Fish for the roe market must be taken immediately before spawning so that the catch period is extremely brief and intense, sometimes a matter of only 15 minutes in a given locality. Purse seiners generally deliver their own catches to the processing plants but gillnetters offload to fish packers.

Because of the intensity of

the fishing, some seiners, in the past, have tended to overload. Others have ventured out into gales at night to deliver their catches. Fatalities have resulted.

Herring caught to northern waters goes to Prince Rupert for processing. West coast and Strait of Georgia fish are brought to Vancouver or Ucluelet or Victoria. After the fish are hardened in brine, the roe is extracted by hand to minimise breakage of roe. The carcasses are reduced for use as livestock feed supplements.

During the 1960s, the herring stocks on the British Columbia coast were badly depleted and herring fishing was banned. Before then, almost all the herring caught was sent to reduction plants.

The Pacific Herring Committee has estimated that 400,000 tons of mature herring spawn each year and that 200,000 tons could be harvested without diminishing the stock. But a catch of between 80,000-85,000 tons now is allowed for the roe fishery in order to make sure the present level catching can be maintained.

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British Columbia has \$300m year

BRITISH COLUMBIA'S 12,000 fishermen had a near-record year in 1977 with a catch that earned \$330 million at first-hand sale. The 6,000 boats that took this fish make up, says Canadian fishery economist Chris Newton, probably the finest small-boat fleet in the world.

But there are moves to cut the size of the fleet. Newton calculates that, if the boats continue to increase in size and efficiency, and if technical advances continue at their present rate, within 40 years 200 purse seiners will do the work of the 6,000.

Because of this impending overabundance, the federal government is expected to cancel licences for about 650 boats by the early 1980s.

There are the boats which, ten years ago, were issued B licences. At that time they were earning less than \$1,250 a year and were considered to be part-time.

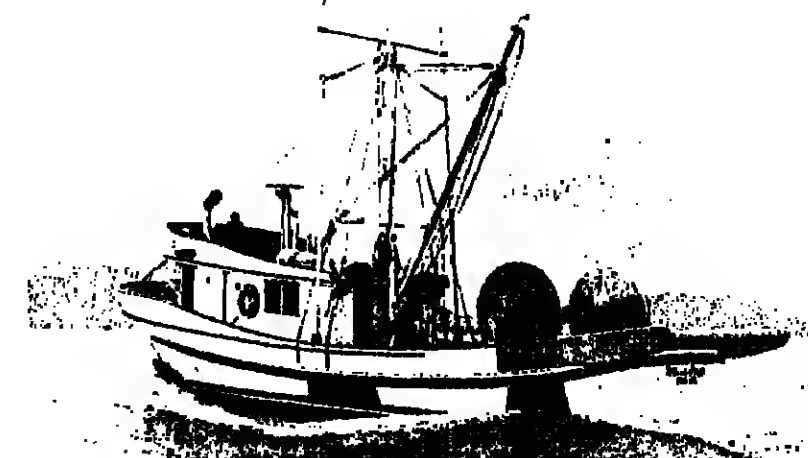
Most regular fishermen would like to see the part-timers and the summer vacation fishers (many of them school teachers already earning \$25,000 a year) phased out. But there are problems. Some old-age pensioners rely on the money earned in

summer month fishing.

While the Class B boats are being phased out, the Federal Fisheries Department is moving ahead on its \$150 million five-year salmon enhancement programme. This is attempting to restore the salmon runs to what they were in peak periods years ago. It includes some new techniques which are expected to assist the catching fleet.

For the salmon fisherman, the enhancement programme is a necessity; and, in the end, he will pay for it through licensing charges. He must be a good businessman, as well as a top-rate fisherman, to remain in the business.

But still too many salmon catchers



A British Columbia drum seiner - modern unit in the finest small-boat fleet.

Interviewed by the Vancouver Sun, Byron Wright, president of BC Fishing Vessel Owners Association, said: "To buy a new purse seiner equipped and licensed only for salmon fishing, the minimum investment is \$325,000, including \$25,000 for a net and \$60,000 for a salmon licence."

"If he is extremely good, the owner should be able to sell his year's catch of salmon for about \$130,000. But the average is more like \$70,000."

"Half of the take immediately goes to the crew, leaving about \$65,000. Next comes the amortisation of the loan needed to buy the

boat; \$32,500 goes to the principal and \$40,000 to interest charges.

"Following that, he must pay \$6,500 a year for insurance, \$5,000 a year for new technology and equipment replacement, \$5,000 for repairs to the net, \$5,000 for boat and engine maintenance, \$3,000 for fuel, and he should leave \$2,000 in the kitty as a reserve for major overhauls. By the end he is already more than \$30,000 behind."

The only way the vessel owner can survive is to work like a madman, count on luck, and get into the lucrative roe herring fishery to increase his income.

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Green light for two new firms

THE registration of two new companies in the fishing industry was approved recently by the Philippines Board of Investments. Queen's Fishing Corporation, a 38 million peso (£3 million) project, will operate mainly for tuna around Luzon, Mindoro and Palawan islands, in the Moro Gulf and in the Sulu and Celebes Sea.

The other firm, Marine Pioneers Inc., is a Filipino-Japanese joint venture for the manufacture of nets.

POWER PLAN

300 Sudanese fishermen to get motorised boats

THE STATE Fisheries Administration in Sudan and Britain's Ministry of Overseas Development are carrying out a joint project at a cost of about £1 million to increase the use of the country's Red Sea coast marine resources.

This project began in 1974 with a pilot scheme to which six small boats powered by 20 hp engines and fitted with ice boxes were rented out by the Administration to villages of Dongoab and Mohamed Qol. But this hit snags when repairs began to far exceed incomes from rental. The boats were then sold to their users for £100 cash in advance and £1,600 payable over three years.

The Administration has since begun providing back-up services at cost, collecting fish caught in the inlets along the coast and transporting it to Port Sudan.

Outlay on this project so far has been £29,000 on workshops, stores, administrative offices and boat building. Revenue from fish sold at the government-controlled price amounted to £6,000 in 1976.

Studies are now being made of how to improve viability by better fishing methods, and £70,000 has been allocated by ODM for this.

One method to be tried is fishing with bright lights to attract the fish. More emphasis is also being placed on bottom fishing.

Shrimps are being surveyed in the Tokar delta of over 800 sq. km. where they occur in considerable amounts. A shrimp fishery there might lead to an industry with yearly export earnings worth £10 million.

At present, there are some 300 Sudanese fishermen operating off the Red Sea coast using 80 boats, including canoes. It is hoped to include all

these fishermen in the drive to greater efficiency by making them owners of motorised vessels. Payment for these would be by instalments.

The ODM is supplying 60 diesel engines for the larger boats, and 50 petrol driven outboard motors. The Fisheries Administration will have 40 new boats built.

A sum of £230,000 will be spent on improving marketing. Hardware to be purchased will include three mobile cold stores each with a capacity of five tons of fish on ice, a quick freezer, and three 1,000-gallon water bowlers.

As far back as 1965, there was interest in Dongoab Bay, 180 km. north of Port Sudan, as a source area for black lip pearl oysters. Oyster farming was intensified in the late 1960s and early 1960s.

In 1968 there were further developments, including an agreement with the Japanese company Asahi Penak for large-scale oyster cultivation. But a year later the oyster beds suffered a mass mortality. The disaster occurred again in 1973 and 1975, and investigations are still going on to find the cause and the cure.

International Fisheries and Marine Equipment Exhibition.

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A warm welcome awaits home and overseas exhibitors and visitors to Europe's largest and most comprehensive fisheries exhibition in 1978. A record number of marine engine manufacturers will be represented. Boat builders, designers, deck and fishing gear manufacturers will be heavily represented. Processing, packaging and refrigeration will show plenty to those interested in the handling side of the industry. Banks and marine insurance companies will be offering their many services to exhibitors and visitors alike.

Products from many parts of the world will be on display with national displays from Denmark, Norway and France.

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BIG LOAN FOR SECOND BURMA PROJECT

THE Asian Development Bank is providing a loan of US\$26 million towards Burma's \$68.3 million Second Fisheries Development Project. The remainder, in local money, will come from the Burmese government.

Main aims of the project are to boost fish production along the Tenasserim coast and to further develop inland fisheries and aquaculture in central Burma and the Rangoon area.

At full development, the project is expected to add about 23,000 metric tons of fish to Burma's production (501,000 tons in 1976). Exports of high-priced species will generate about \$17.5 m. in foreign exchange.

The project should also substantially improve the incomes of nearly 900 small boat operators through mechanisation. It should also create nearly 4,000 jobs for skilled and unskilled workers who will be employed by the People's Pearl and Fishery Corporation (PPFC).

Local demand

To be implemented over a five-year period the project is aimed at meeting the growing local demand for fish, particularly in the protein-deficient areas of central and upper Burma.

This is the Bank's second loan to Burma for fisheries. The first, of \$9.8 m, was approved in September 1974.

Fish is an important source of protein in the Burmese diet and represents an average of 30 per cent. of expenditure on food. To supply the need, Burma has an estimated potential production of 600 million tons a year from marine fisheries alone.

The project will require 94 small trawlers (in the 10-ton class), six 15-ton and six 60-ton purse-seiner/trawlers, and two 250-ton stern trawlers. Other vessels will include ten small collecting boats, two 300-ton refrigerated carriers, and two 20-ton supervision boats.

British trawler to join Brunei fish hunt

A SMALL British steel-hull trawler, which spent part of last year 200 ft. underwater after sinking off the south-west coast of England, is to start a new career as research vessel in South-east Asia.

The boat, the 50 ft. (15.24 metre) *Girl Rona*, has been acquired by the White Fish Authority. She will be the main component of a fisheries research and training project to be carried out by the Brunei Fisheries Department.

A British master fisherman, Skipper Mervin Hough, will accompany the vessel.

When she is delivered to her new owners in the middle of this year, the 280 hp *Girl Rona* will carry a variety of modern catching gear and deck machinery. She will be manned in her training and research role by a skipper, a scientist and four crew. Total cost of boat and equipment will be about £160,000.

"This contract marks an important step forward in Brunei's efforts to establish an offshore marine fishery," said Director of Fisheries Dick Beales.

It will be the first major fisheries project by the Department since it was created in 1966.

New career for a vessel raised from the seabed

A food marketing study in 1975/76 estimated Brunei's fish demand in 1984 at 8,000 tons a year rising to 12,000 tons.

But the local catch has been declining. To reverse this, funds were made available for development.

Initially, the boat (built in Cornwall in 1975) will be used to locate and evaluate the potential of marine resources along the coast of Brunei. She will carry out exploratory fishing up to the 100 fathom line which is about 40 miles offshore.



The 50 ft. "Girl Rona" prior to her sinking. She is now being refitted by the WFA for her new role in Brunei.

Commenting on the WFA's involvement in Brunei, Beales said: "My impression of the WFA is that it is an extremely professional and practical organisation. In small developing countries one needs a practical approach that is applied to immediate problems, and this is why we opted for the WFA to help us with our problems."

Over the next few years, the WFA hopes to provide further experts to assist in Brunei's fisheries development programme. Some of the specialist studies which might come into this category are the use of WFA portable trawl gear performance, instrumented mid-water trawling experiments, and handling and storage of fish and fish products.

In addition to operating the vessel and training crews, he will provide advice to artisanal fishermen and to potential investors in larger boats for trawling.

Vietnam market in turmoil

IN A report presented to a conference in Ho Chi Minh City in southern Vietnam, the Ministry of Marine Products revealed that in 1976 the southern provinces had a fish production of 512,000 tons. The 1977 plan was for a small increase but it was fulfilled by only 86 per cent. with 507,000 tons.

Although the amount of seafood collected and bought by the state fell short of target, there was a substantial increase — from 75,780 tons (14.7 per cent. of the total) in 1976 to 180,970 tons (35.6 per cent.) in 1977.

Weaknesses

It was recognised in the report that, along with the encouraging results, the fisheries in the southern province had also shown several weaknesses. Seafood production had stagnated and even tended to decrease. Processing had diminished both in quantity and quality, and the market had been constantly in turmoil.

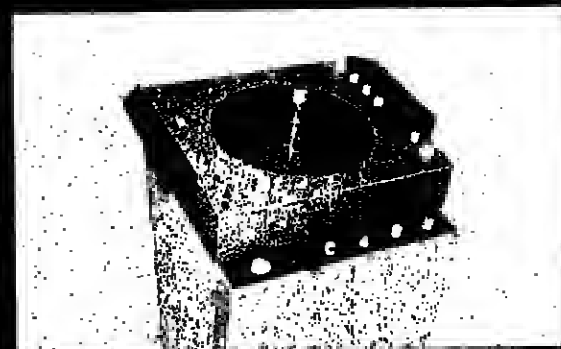
If the province is to achieve its production target of one million tons a year by 1980, said Deputy Premier Do Mui, "we must solve many problems."

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ATLAS Rugged Radars.



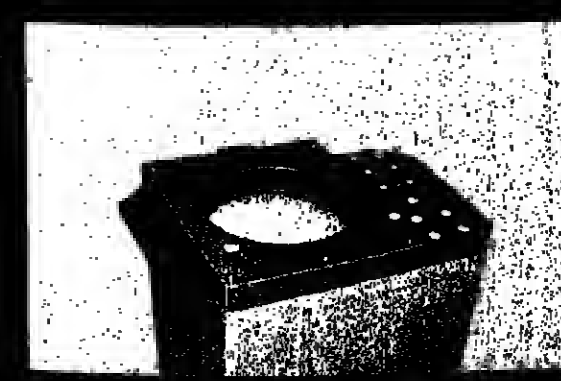
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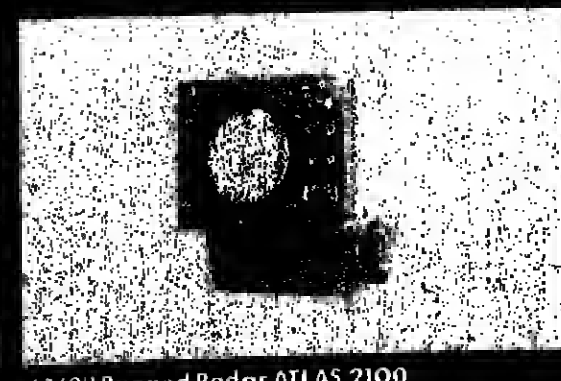
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A fish seller shows his wares in a Kerala market. More than 50 per cent. of the catch is eaten fresh and upwards of a third is sun-dried.



900,000 FISHERMEN BUT NOT ENOUGH FISH

A NEW "working paper" describing small-scale marine fisheries in India must rank among the most practical and compact guides to this activity.

It provides general information on the fisheries and looks at their problems and prospects.

From presentation of relative data and a brief history of the fisheries, the report goes on to deal with the following subjects: Fisheries administration, specialised institutions, fisheries corporations and co-operatives, resources, production,

craft and gear, landing facilities, handling and processing of fish, marketing and distribution, export and import trade, ancillary industries, socio-economic aspects, and government policy and development plans.

As can be readily appreciated, most of these chapters call for a report on their content. This is especially the case because India is a sub-continent containing the equivalent of a dozen or more European countries and has a population — some 600 million — about double that of Europe.

Production

The Indian coastline exceeds 6,000 km and marine production amounts to more than 1.4 million tons. (Another 800,000 tons of fish are harvested from inland waters.)

More than 50 per cent. of the catch is consumed fresh while upwards of a third is sun-dried. It is estimated that the number of fishermen and their families exceeds 5.5 million and the vast majority are involved in small-scale fisheries.

Even though so many people are engaged in fisheries — the number of fishermen is estimated at more than 900,000 — there is room for increased production from the coastal waters.

"The present exploitation

**CEDRIC
DAY
looks
at a
new
FAO
working
paper
on India**

of marine resources is still fractional," the report states. "There is much unexploited area, even along the coastal waters which are potentially rich fishing grounds. The offshore waters largely remain under — or unexploited. In this context the development of small-scale fisheries should have high priority, not only for increasing fish production from this sector but also for further betterment of the socio-economic conditions of this community."

Increase

Of the 22 states and nine union territories that comprise India, eight states and five union territories have maritime fisheries. All of these could increase the exploitation of their coastal waters.

In addition to the administrative structure at central and state government levels, India



Beach landing the hard way — the crew heave a fishing canoe on to the shore in Kerala state.

has a number of specialised institutes. The main ones are described in the report. They include the Central Marine Fisheries Research Institute in Cochin, with a regional centre, 12 research and 29 field stations; the Central Institute of Fisheries Technology in Cochin, with three sub-stations and four research units; the Central Inland Fisheries Research Institute in Barrackpore, with three sub-stations and 11 units, and the

National Institute of Oceanography in Goa, which has regional centres in Cochin and Bombay.

Training

There are a number of training institutes, some of which have operating units, such as the 30 training centres for marine fishermen. There are also fisheries corporations in most of the maritime states and some thousands of

fisheries co-operatives, but only about a third of these are operative.

The prime requirement seems to be to make these various institutes and other organisations more effective in the interests of small-scale fishing in India.

Several important development projects, supported by international and bilateral agencies, including FAO, are providing assistance in development of the sector.

Doing things the hard way

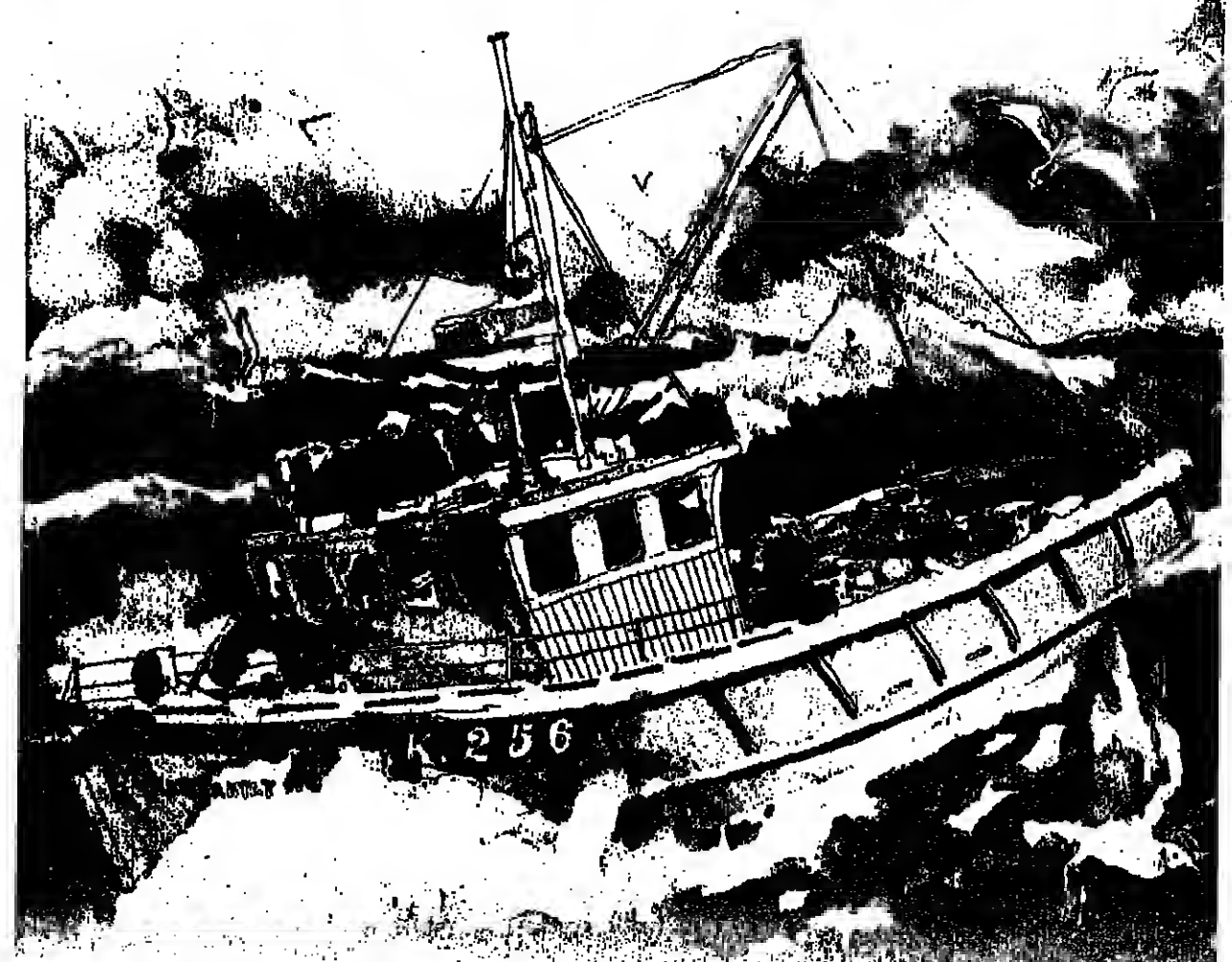
A fish seller in southern India carries her wares from the beach to the town market.

including harbours, boat building and exploratory fishing.

Allocations

The overall importance accorded to fisheries development by the government of India is reflected in funds allocated for this purpose in succeeding Five-year Plans. Expenditure in the first Plan (1951-56) was 27.8 million rupees. For the fourth Plan (1969-74) the sum was 511.1 million rupees. In the current Plan (1974-79) the allocation is 1,019.4 million rupees (about £103 million).

Judging from past experience, the expenditure is likely to amount to about 70 per cent. of this allocation. Unfortunately, from the point of view of most fishermen, the industrial rather than the small-scale sector chiefly benefits from Plan funds.



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THE WORKING PAPERS

AS WE reported in the March *FNI*, the FAO/UNDP project for the Development of Small-scale Fisheries in South-west Asia has prepared a series of working papers on fisheries in Sri Lanka, India, Bangladesh and Pakistan.

They are not official documents, but they have a special value as personal, on-the-spot studies carried out in co-operation with the fishery authorities.

This summary of the working paper on India will be published in three parts in the first *FNI* correspondent Cedric Day gives general background information. In parts two and three, he will deal with boats, handling, processing and marketing, and the longer term issues.

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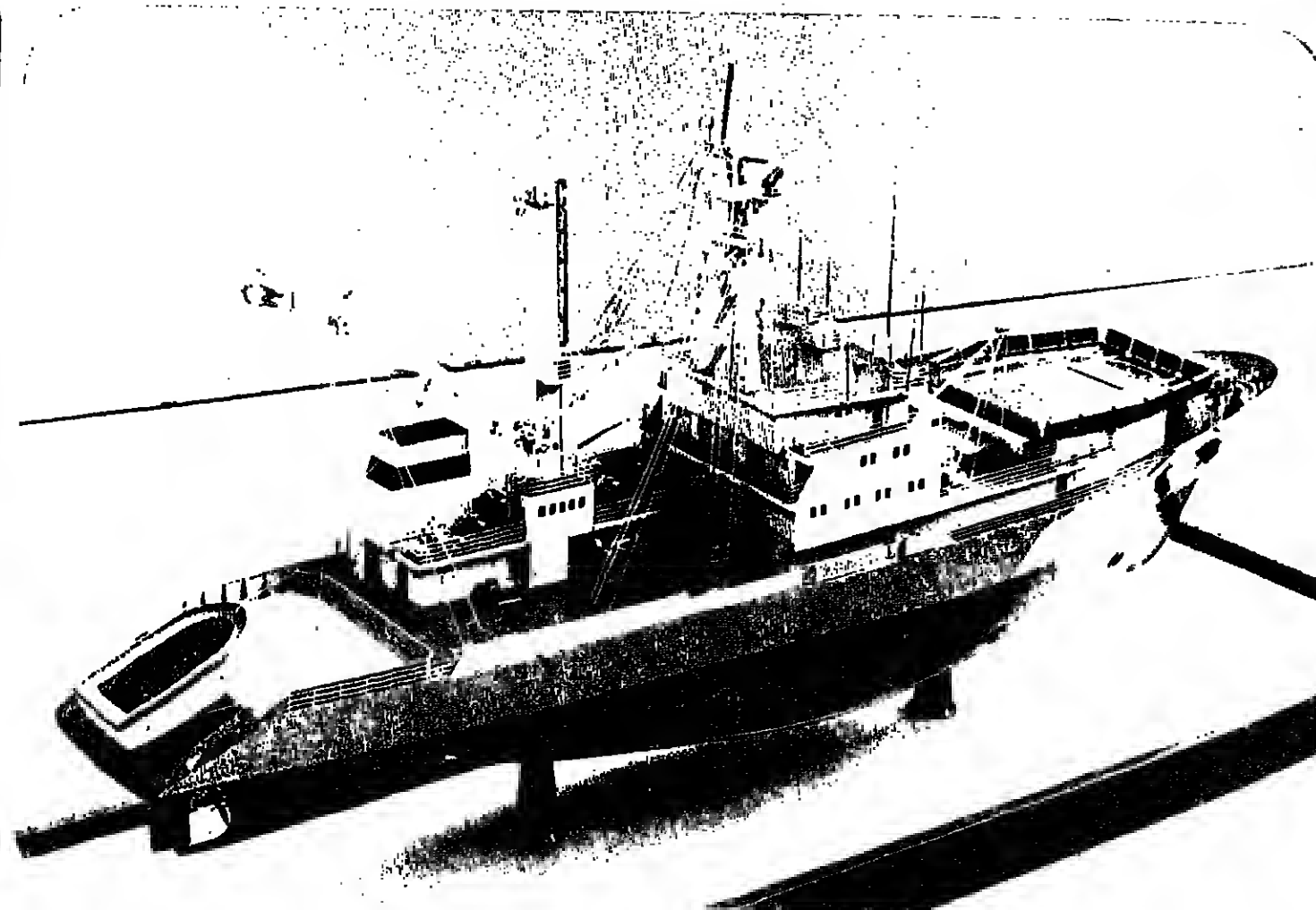
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This model of the *Rodina*, building in Poland for the Soviet Union, shows how much she departs from the traditional design of the tuna purse seiner. She is 85 metres (278.8 ft.) long overall, 7.5 m. bp with a breadth of 15 m. and deadweight capacity of 1,800 tons. There will be accommodation for a crew of 36.



A whole changed concept in seiner design

Main dimensions

Length overall, 85.0 m.	Deadweight, 1,800 tons.
Length b.p., 75.0 m.	Propulsion, Sulzer-Zgoda 5,200 hp diesel.
Breadth, 15.0 m.	Fuel oil, 1,100 cu. m.
Depth to upper deck, 9.2 m.	Fresh water, 84 cu. m.
Moulded draught, 8.0 m.	Lube oil, 65 cu. m.

FOR ITS second series of tuna purse seiners, the Polish shipbuilding industry has turned to the North Shipyard in Gdansk. The first series, for Mexico, were in the now-traditional California-style, designed by Rados and using the ammonia brine well system of refrigeration.

The new series is for the Soviet Union. It begins with the 85 metre long *Rodina* which was launched in February and it is to designs of ship and process system substantially different from the conventional tuna seiners.

Designed and built to conform to regulations of USSR Ship's Register, the *Rodina* will have a Sulzer-Zgoda type 8ZL40/48 main engine developing 5,200 hp at 530 rpm. Power plant consisting of three 800 kVA alternators will be driven by three Sulzer-Cegielski 6AL25 engines.

Fuel oil

When proceeding to fishing areas, the ship will be able to carry 1,100 cu. m. of fuel oil, 84 cu. m. of domestic water and 55 cu. m. of lube oil.

The ship's hull is steel with aluminium alloy superstructure. She has a transverse framing system and the hull is divided by bulkheads forming the following compartments: holds 1, 2 and 3; fuel-cargo tanks, engine room; fuel and water tanks.

For fishing, the *Rodina* will have a purse net 2,000 m. long by 250 m. deep. Catching operations can be controlled from three points: the signal mast, the navigation deck and the despatch-control cabin.

In this picture, completion was still some way off for the Gdansk yard's prototype 85 metre tuna purse seiner for the Soviet Union.

She is designed for fishing and will have electric single-drum winches powered by Leonard system. Each will have a nominal pull of a heul-in speed of 10 m/min. Each drum capacity for 2,500 m of rope.

Other deck machinery includes an electric single-drum winch, an AC electric "choker" winch, a warping capstan, a power block.

To assist in net handling, the ship will have a skiff, 12 m. beam and powered by two engines. She will also have speedboats 4.5 m. long, 90 hp outboard motor.

The ship's processing system has been designed for a high quality product and prices. Tuna will be drained of blood, giving a slightly pink colour.

On the fishing deck, the net will be removed and the fish will be hauled to the

bleeding. It will then pass through the hatches to the processing plant on the main deck for further silwater washing and cooling down to 11 deg. C. It will go then to the gutting tables and then to the freezing tunnel. This will have a capacity for about 20 tons in 24 hours, freezing the fish down to minus 20 deg. C in the core.

To the holds

The fish will then go to the holds which will be air-frozen down to minus 25 deg. C.

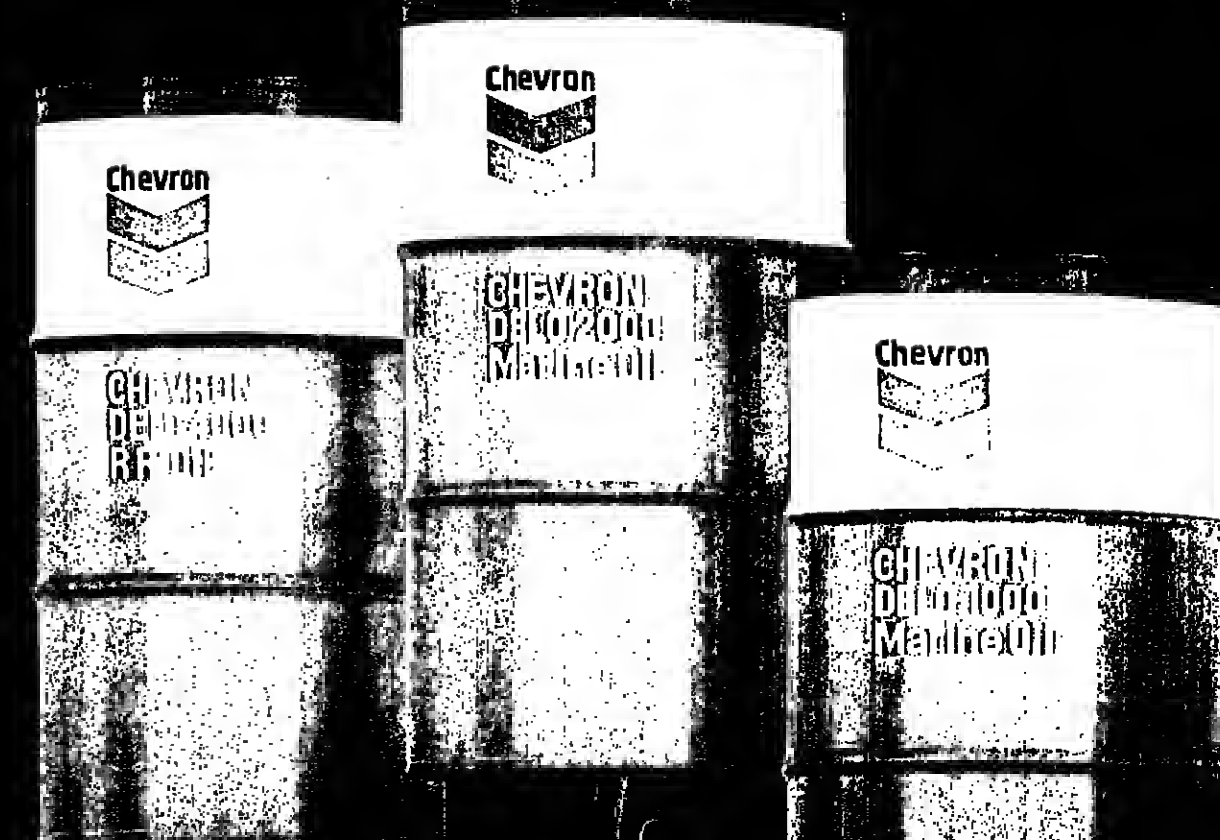
To help handle big catches above the capacity of this plant, the ship will have four brine tanks for freezing ungutted tuna.

Offal and waste fish will go to a vertical freezer with a capacity of five tons in 24 hours to be held as food for animals in fur farms.

The refrigeration plant will use Freon R-22 and its main units will be three screw compressors with an output of 120,000 KCal/hr, and associated plant, providing cooling down to minus 35 deg. C.

The *Rodina* will carry a helicopter. She will be completed later this year.

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Dims.: 38, 17 x 7,80 x 3,80m.

Main engine: 1000 HP WICHMANN

4-cyl. with propeller nozzle.

Winch equipment: 2 split winches,

2 netdrums, anchor-end-tackle-winch, powerblock.

Electrical: 3 x 380 volt, 2 generators each 60 KVA,

220 volt for light.

Electronics: SP-sailor radios.

Alas fish finding equipment.

Accommodation: 11 berths (3 single cabins).

Fishholds: 3 fishholds. Total capacity 370 cu. m. All

holds insulated with polyurethane and lined with

steelplate.

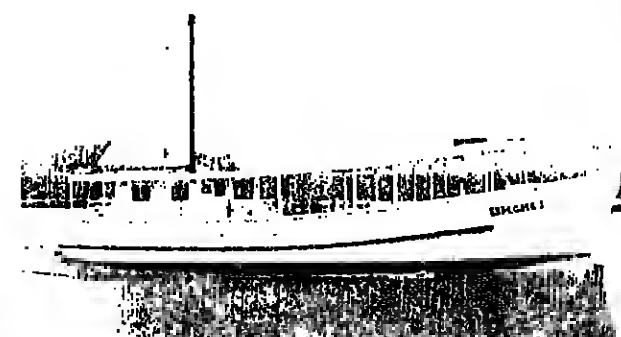
The vessel could easily be shelter-decked.

Price: Offers invited for a real bargain.

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BOATS & BUILDERS



AN INTERESTING boat completed recently in the St. Augustine, Florida, yard of Desco Marine is the 68 ft. long GRP and wood vessel *Explorer 1*. She has been built for Desco's parent company, the Whittaker

Corporation, and is fitted out for snapper fishing. The main engine is a Detroit Diesel developing 365 hp and turning a Columbia fixed propeller through a Twin Disc 6:1 gearbox. The auxiliary

engine is a Lister diesel.

Desco has now started deliveries against the orders it has been taking on the United States west coast (See *FNI* January).

Fitted out for shrimping and fin fishing, the 75 ft.

GRP boat *Sea Blazer* is for A. J. Congo and R. Putnam of Astoria, Oregon.

She is also powered by a Detroit Diesel 365 hp engine turning a Columbia propeller through a Twin Disc 6:1 reduction gear.

TWO MORE FROM DESCO



ACM'S FIRST

THE 62.75 metre long tuna purse seiner *Jacques Cartier* is the first fishing ship to be completed this year by the Saint-Malo yard of Ateliers et Chantiers de la Manche. She will be operated in the Atlantic tuna fishery by Compagnie Generale de Grande Pêche.

Standard

Built to the yard's standard design for ships of this type, the *Jacques Cartier* is 851 gross tons and has 1,000 cu. m. capacity in her fish tanks.

She is powered by a General Motors diesel engine developing 3,600 hp at 900 rpm, which gave her a speed of 18 knots.

Accommodation of a high standard is provided for a crew of up to 18.

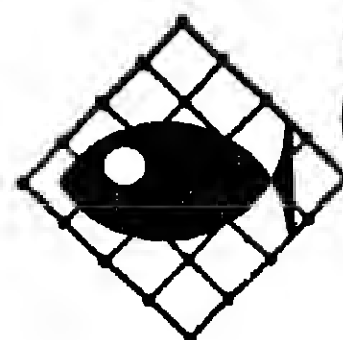
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DRUM SEINER JOINS A NEW FLEET



THE 19.8 metre long drum purse seiner *Prospect Point*, delivered to her owners in mid-February, is the 12th boat in a new fleet operated by the Quality Fish Company in British Columbia. This is a co-operative group which custom packs its product through Queen Charlotte Fisheries Ltd., and sells canned fish in Canada and Britain.

Quality's general manager, Kim Gaynor, expects three more boats to be delivered this year.

Of welded aluminium construction, the *Prospect Point* comes from the Richmond, British Columbia, yard of Shores Boat Builders Ltd., She was designed by David Moore.

The main engine is a Caterpillar D343 diesel rated at 365 hp and giving a speed of 10.3 knots. A Twin Disc Omega reduction gear enables the engine to run at speed while the propeller turns over slowly.

A Furuno FH105 sonar is

one of the first three to be fitted in a vessel on this coast. Other deckhouse equipment consists of a Furuno radar, Ekkolite sounder, and two radios.

On deck, Seatec winches handle the anchor and purse seine net.

Quality Fish Group is a two-year-old company headed by Byron Wright who is skipper of the purse seiner *Prosperity*, a four-year-old aluminium hull boat. The owner of five boats, he has been fishing for 25 years.

The *Prospect Point* has sleeping accommodation for six men in the forecabin, plus the skipper's accommodation under the wheelhouse. But she is expected to be operated by five men plus skipper. She cost about \$500,000 to build and equip.

Shores Boat Builders started in business ten years ago building small aluminium boats. About five years ago, the company moved to Richmond, a municipally-adjacent Vancouver, and is engaged in the construction of larger craft for the coastal fishing fleet.



THE *Alaskan Beauty*, a 97 ft. (29.6 metre) crabber — pictured above — delivered on March 4, is the 50th vessel larger than 58 ft. (17.7 m.) delivered by the Marine Construction and Design Company (Marco) of Seattle since 1968.

In that year, Marco began building the large steel-hull crab boats which have become more or less standard units in the US Pacific north-west fleet.

This new boat is owned by Gunnely Loklingholm and Howard Carlough. She is now working in the Alaska tanner crab fishery.

The *Alaskan Beauty* is similar to the *Polar Sea*, described last month. She is powered by a Caterpillar D398 engine producing 850 hp. Two

Fifty in 20 years

Caterpillar D3304 engines power 94 kW generators.

Her two fish holds equipped with a seawater circulation system can store up to 140,000 lb. (63,520 kilos) or live crab for weeks at a time if necessary.

HONDURAS SHRIMPER

THE Diesel Shipbuilding Company of Jacksonville, Florida, has delivered the 720 (122 metre) long *Captain Jimmy* to Spurgeon Miller and Foch Merren of Guanaja, Bay Islands, Honduras. She is a steel-hull combination lobster and shrimp vessel. This is the second boat the

yard has built recently for owners in Honduras.

Propeller

She is powered by a GM Detroit Diesel rated 340 hp at 1800 rpm and turning a fixed propeller through a 6:1 reduction gear.

With a gross tonnage of 96.21, she has a hold capacity of 2,700 cu. ft. (76.45 cu. m.). The catch is cooled by a two-unit Thermo King FBH refrigeration system.

The boat is equipped with a Stroudsburg Model 519T winch.

Series built GRP boat

A NEW type of GRP-hull fishing boat developed for series building has been completed by Constructions Nautique du Poulguen in France. The 15.3 metre boat is intended for inshore fishing on the west coast.

Named the *Fleur des Vagues*, she is 5.2 m wide and is powered by a 220 hp engine.

GRP boats are not new in the French fishing fleet, but this comes from a moulder normally associated with yacht and power boat hulls who delivers them for finishing off in boatyards.

This first boat was bought by two brothers, Serge and Dany Debec, who are members of a Croisic fishing group. Its cost, ready for operation, is estimated at about 220,000 francs (\$24,310).

QUIET

IN A QUIET year for fishing boat construction, French yards delivered only four trawlers last year. They also launched a tuna purse seiner and began work on a small research vessel.

At its Dieppe yard, Atelier et Chantiers de la Manche completed the 626-ton stern trawler *Jules Verne*. Three 85-ton small stern trawlers were built for Syria by Ateliers et Chantiers Ziegler Freres.

The tuna ship launched was the *Proce de Jolville* at the ACM Saint-Malo Yard.

Ordered by CNEXO, the 100-ton research vessel *Thalia* is being built by Constructions Mecaniques de Normandie.



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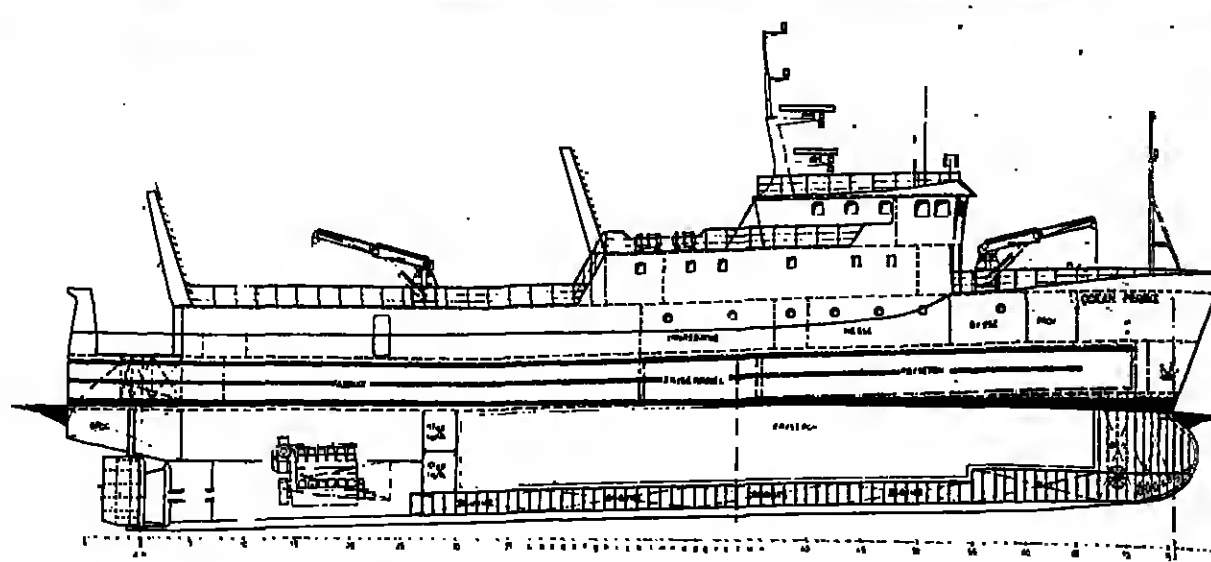
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BOATS & BUILDERS

ADVANCED
SHRIMP
FACTORY
TRAWLER

DESIGNED to operate in the waters off Greenland, the 56.4 metre long *Ocean Prawns* is one of the world's most advanced shrimp catching and processing ships.

The ship was built by the Norwegian yard Langsten Slip & Bnhyggeri A/S of Tomrefjord for

Danish owners Birger Pedersen, Flemming Nilsen and Kristian Jensen of Bornholm.

She is designed for the harvesting of the pink shrimp (*Pandalus borealis*) and to process it aboard at the rate of some 40 tons in 24 hours. For this, she has a highly

mechanised factory line capable of boiling and peeling shelled shrimp and peeling and vacuum packing.

The line for shelled shrimp consists of two steam boilers, three graders by Dageggi of Denmark, a freezing tunnel and packing desk with automatic weighing in five kilo boxes.

Conveyors and other equipment in the process lines were supplied by Kronborg of Denmark.

There are also two boilers in the peeling section, which has two American Laitrum peeling machines and Laitrum cleaner and separator.

The prepared shrimp are moved from factory to fish hold by a three-ton elevator.

Refrigeration plant is by Sabroe and consists of four TSMC-8-100 compressors with a capacity of 4 x 93,000 KCal in 24 hours. The three Sabroe freezers can handle up to 30 tons a day.

On the fishing deck the *Ocean Prawns* has two trawl arenas so that two sets of gear can be ready for use at the same time. The main winch is a Hydraulik Brattvaag machine.

Because of the difficulty of trawling in ice conditions, Langsten Slip has designed a special hydraulic galleys which help lead the trawl wires very close to the after part of the ship into the sea.

The *Ocean Prawns* is 48.92 m. long overall, with a breadth of 10.4 m. and depth to

shelterdeck of 7.08 m.

She is powered by a Wichmann model 72X engine developing 2,100 hp at 95 rpm and turning a four-blade Wichmann controllable pitch propeller. The auxiliary engine is a Caterpillar 346 driving a 228 KVA Stamford generator.

Crew of 33

Accommodation is provided for a crew of 33. Full hold capacity is 1,110 cu. m.

To assist in finding her catch, the *Ocean Prawns* has two Simrad EQ echo sounders, MC situation display unit and CI scope. She has two Decca radars and Magson MX 1112 satellite navigator. Radio equipment consists of Sailor T126 SSB, Skani TRP 5000, and Sailor RT 143 and RT 144. There are two radio direction finders, one Furuno and one Simrad.

A specialist in the building of ships of this type, Langsten Slip has in the past three years delivered eight such vessels to the Faroes and Denmark.

THE Norwegian purse seiner and trawler *Torbas* is the first ship of a new class, designed by Ulstein Trading and built by the group's Hutto yard.

The 55.7 metre long ship was delivered to her owners Stale and Tore Remøy of Leirdy in February.

With the growth of the blue whiting fishery and possibly other deepsea fishing opportunities, the combined purse seiner and pelagic trawler large enough to venture far out from the coast could be an important new vessel type in the Norwegian industry.

In designing the *Torbas*, therefore, Ulstein's project department worked in close co-operation with the owners to create a vessel that could be developed for series building.

The ship has a length b.p. of 49.8 m., a moulded breadth of 10.4 m. and depth to shelter deck of 7.45 m. Her gross tonnage is 900 and deadweight capacity 1,000 tns. She has a fish hold capacity of about 8,000 hectolitres (800 tons) of which 4,000 hl is in RSW tanks. There is also refrigerated space of 1,500 hl. The cooling plant is by Lehmkul.

LARGEST AND THE FASTEST

NORWAY'S largest fishing vessel, the trawler and purse seiner *Libas*, has been delivered by Georg Eldes Sønner A/S of Hvalbygd to Peder O. Lie of Brattbøl. The 1,348 gross ton ship is 71.3 metres long with a beam of 11.6 m. and depth to shelterdeck of 8 m.

Her 15-man crew have single cabins

each with shower and toilet.

Powered by a Wichmann 9A17G engine of 3,600 hp, the *Libas* has a service speed of 17.5 knots, which makes her Norway's fastest fishing vessel.

She replaced Peder O. Lie's two purse seiners. These are converted whalers, and they have been sold to a Norwegian and an

owner in the Faroes.

The *Libas* began her career fishing for winter capelin off northern Norway. When the capelin season ends, she will go fishing for blue whiting in the north-east Atlantic.

Designed by V&K & Sandvik A/S, the ship is reported to have cost about 24.5 million kroner (£2.2 million).

New-design
trawler
and
purse
seiner

forward on the shelter deck. The trawl wires are led through blocks to the trawl galleys.

Net bins

Two purse net bins of 70 cu. m. capacity each are on the starboard side. To handle her

big purse net, the *Torbas* is equipped with a Triplex net winch.

Another interesting feature of the ship is the replacement of the conventional mast/boom arrangement by a three-ton hydraulic deck crane. Supplied by Maritime Hydraulics, this crane can be

operated through 360 deg. and so can serve all the hatches. The *Torbas* is a fast ship with a speed of 16 knots. To achieve this, she has a Deutz BV 6M 540 1300 hp engine turning an Ulstein controllable pitch propeller. The ship is also fitted with two Ulstein transverse thrusters type 40 TV of 400 and 500 hp.

Single lever

To assist manoeuvring, the *Torbas* has the Ulstein ECM hull manoeuvring control system which makes it possible to control all propeller functions by a single lever. It is believed that she is the first fishing vessel to be equipped with this system.

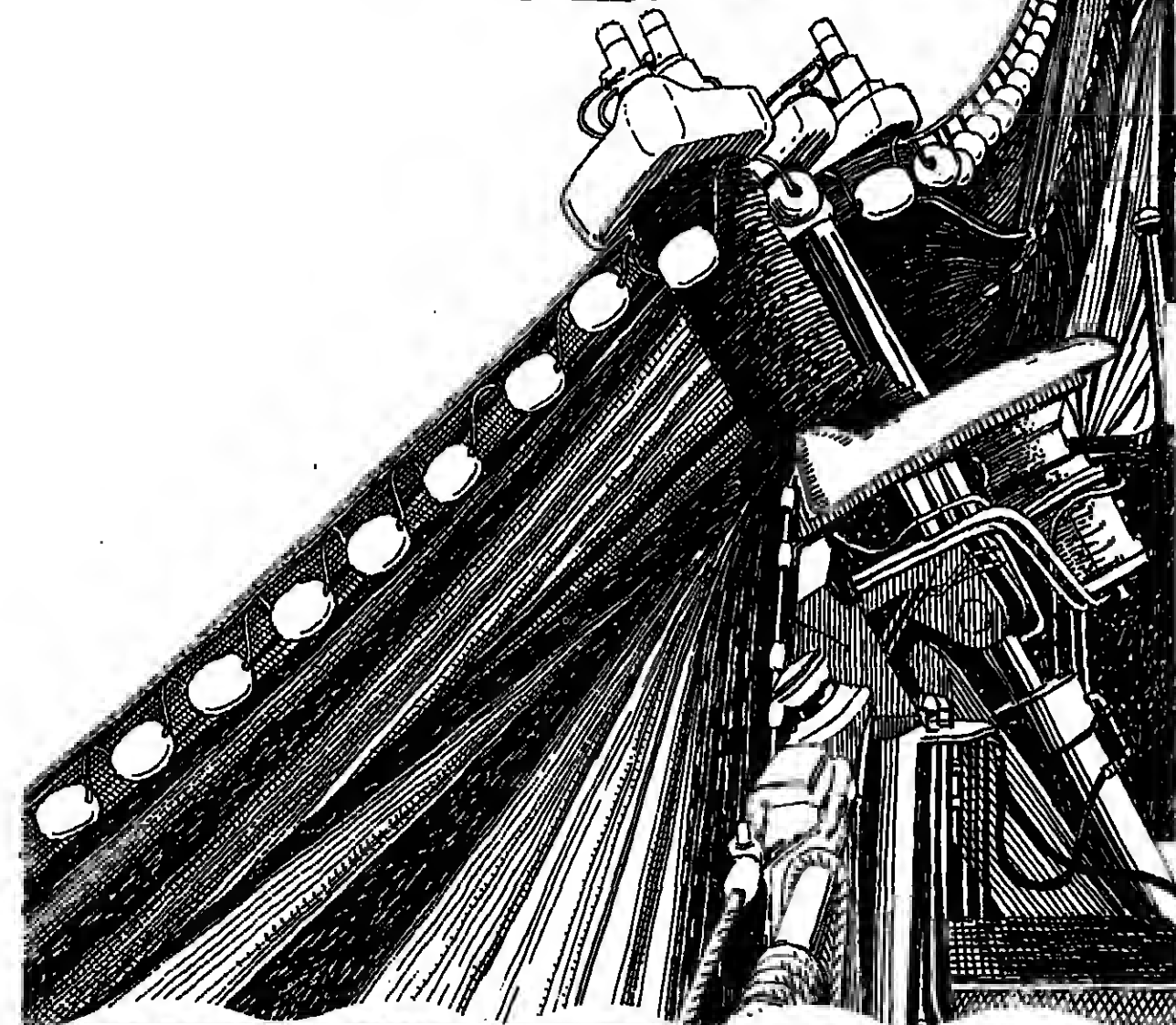
Prominent in her equipment array of fish finding and

navigation equipment, is the Simrad CD Situation Display sonar system. Echo sounders are by Flac and included the 1A7 and Superlador. For Navigation, the ship has two Decca radars an RMS 1630 and RM 916, two Kodak automatic radio direction finders, Robertson AP7 autopilot, Decca Navigator MK 21 receiver, and Magnavox MN100 for satellite navigation. Steering gear is by Teitford.

For radio communication, the *Torbas* has been equipped by V&K Radio with Sailor medium and short wave sets and two Sailor radio telephones type RT 143 and RT 144.

For better stability, the ship is fitted with the Ulstein passive stabilising system.

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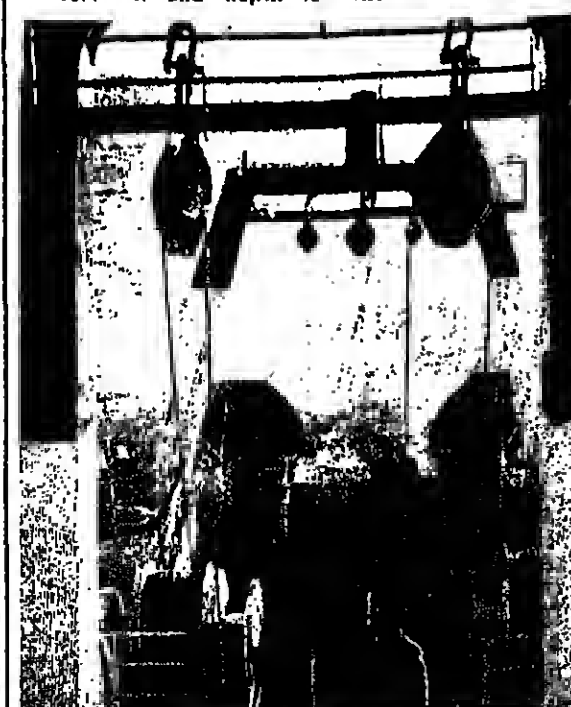
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The hydraulic galleys designed and made by Langsten Slip.



The trawl deck, showing the main drums and the two net arenas.



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BOATS & BUILDERS



TREEVE MARINE LTD., of Hale in Cornwall has exported one of its 13 and a half foot (4.7 metre) long Cove boats to Indonesia for use as a purse seine skiff.

The GRP boat has Morse Teleflex steering with forward gear lever and throttle control. It is powered by a Lister STIMGR2 marine engine. A Whale gusher pump is also fitted.

Seen on the left in this picture, the skiff

has been specially strengthened with a beamshelf and heavy duty longitudinals running from forward through the engine beds to the transom knees.

Treeve Marine has been asked to tender for several more such boats for Indonesia.

The boat on the left is for use in an experimental breakwater project in Southampton. As it has to go alongside steel floats, the GRP hull is protected by timber fendering.

STEEL BOATS TO JERSEY

THE FIRST of a new series of 35ft. (10.67 metre) long steel hull workboats built by the English yard Avon-Brunel Marine Ltd., will go to Egypt for use as a harbour launch. The second will operate as a fishing boat from Jersey in the Channel Islands.

Since the design was introduced, Avon-Brunel has had more than 60 enquiries and several more boats will go into fisheries in Britain and abroad.

The hull is of the twin chine type with a transom stern. All of the plating follows developed curves so that no difficult plate bending is required. The beam is 11 ft. and the draft between 3 and 4 ft. depending on the machinery fitted.

Fuel capacity is 200 gallons and this can be either in separate tanks or tanks built integral to the hull.

The boat can be fitted out with either a forward or aft wheelhouse to suit requirements. The hull is available for fitting out by the customer or it can be completed by Avon-Brunel with a variety of equipment as options.

Ford engines

Engines can be single or twin screw, with the optimum single engine the Ford six-

cylinder diesel. Speed range is between nine and 12 knots.

The boat for Jersey will have a Darglow six-cylinder Ford engine which produces 113 hp. These Darglow engines are re-conditioned units which are available at a considerably reduced price compared with new engines.

Exports

It will be a forward wheelhouse version and has been ordered by North Jersey Fisheries Ltd., Avon-Brunel's agent in the Channel Islands. Avon-Brunel is looking for agents in various areas of Europe. It anticipates a considerable export market for the design.

The cost of the bare hull with fittings is £4,750. This is to Lloyd's requirements allowing the boats to be completed to Lloyd's standards, if required. The 35ft. hull offers a 21 ft. cockpit and this together with the low price should make these new boats an attractive proposition to fishermen.

Indian yard wins award for exports

INDIA's Engineering Export Promotion Council has awarded a certificate of export merit to the Calcutta GRP Boatyard, Gladstone Lyall and Company. The award is for an outstanding performance in the year ended March 1977.

Gladstone Lyall set up its modern yard in the Indian west coast port of Mangalore in 1971 with technical collaboration from Watercraft Ltd., of Britain.

It built its first GRP hull trawler in 1971. Four such boats, measuring 32 ft. (9.75 metres) long, were exported to Bangladesh in 1973 and 1974.

In 1975, the yard obtained an order from Sri Lanka for 30 GRP boats each 38ft. (11.6 metres) long. Yards in 18 countries, including Britain and Japan, tendered for this contract which was assisted by a loan from the Asian Development Bank.

The yard has built GRP boats for Kenya and Somalia.

US yard designs patrol vessel

LANTANA Boatyard in Florida, USA, has designed a patrol boat for 200-mile fishing limits. The design marks a new departure for this company which has specialised in steel and alu-

minum fishing and work boats. The new design can be built up to 220 ft. It is seen as an offshore vessel capable of making extended patrols. The yard is planning to market world-wide.

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Saudi boats could be first of a fleet...

A YARD in England is building two small GRP hull boats for fishery research work in Saudi Arabia. The order, worth £85,000, was placed last month by the White Fish Authority with the Cornish builder Cygnus Marine.

Designed for work in the Saudi Arabia fishery development project now in its third year, the boats will be used along the Red Sea and Persian Gulf coasts.

"They could," says the WFA, which is carrying out the programme for the Saudi government, "be the forerunners of many commercial fishing boats needed to modernise and expand the Saudi fishing industry."

According to WFA technical director Robert Bennett, the two boats will play an important part in the programme.

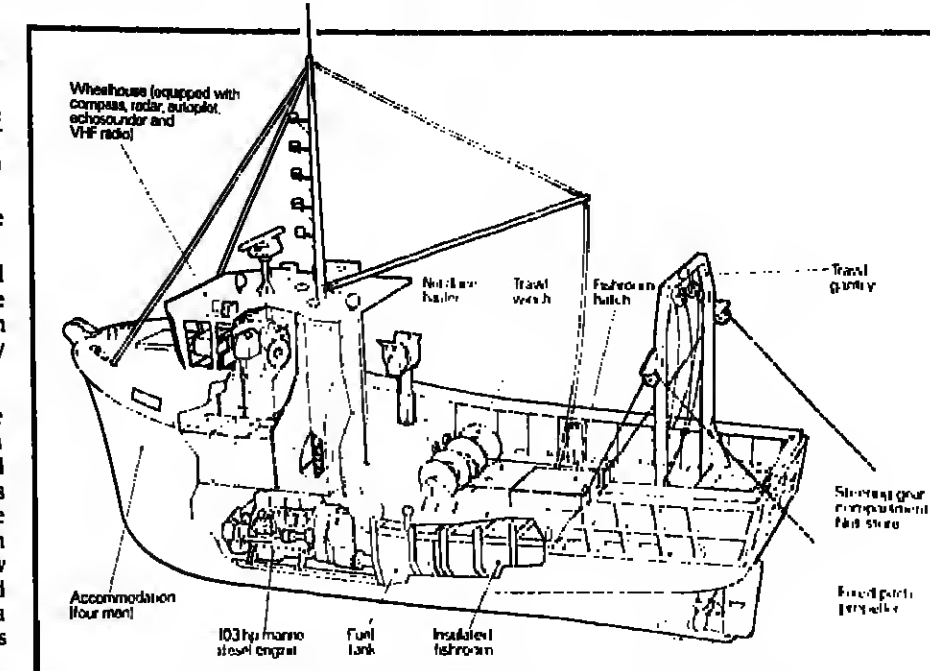
Boats of modern design are seen as essential if substantial long-term improvements are to result from the project. The boats will need to be simple enough to be worked by fishermen used to much more primitive craft and they will be serviced by local firms.



WFA technical director Robert Bennett — first boats in a new fleet for Red Sea and the Gulf.

With about 25 of these boats, landings in the eastern region of Saudi Arabia could be boosted 25 per cent. This would mean 1,500 tons more fish worth about £2.2 million a year. Calculations now being finalised for the Red Sea coast should indicate a substantial potential there as well.

Because of the work they will have to do in test fishing and possibly training, the two Cygnus prototype boats (see drawing), will be more sophisticated than the eventual commercial craft. One of them will work in the Red Sea and the other in the Gulf. Saudi fishermen will partici-



ipate fully in trials and demonstrations.

The design is based on the CygnusGM-32 hull. The wheelhouse will be forward as will accommodation. The engine room will be amidships and the fishroom aft. Fishing methods will include stern

trawling, gill netting and longlining.

Each boat will be about 10 metres long overall, 3.8 m. in the beam and have a maximum draft of 1.5 m. The insulated fishroom will have a capacity of 3.5 cu. m.

It will be powered by a

Suhre marine diesel with a heavy-duty reverse reduction gearbox driving a Brunton's fixed-pitch propeller. The engine will be tropicalised and will produce 100 hp under continuous operating conditions, to give a free running speed of eight knots.

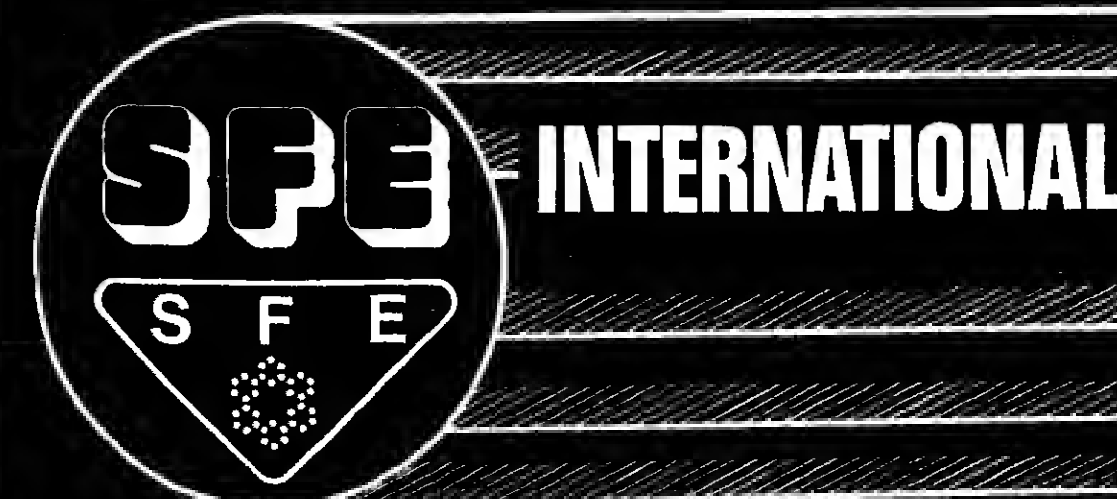
Deck equipment will include a twin-harrel, one-ton Spencer-Carter hydraulic winch and a Spencer-Carter pedestal-mounted net-line-pot hauler. The winch will have a total capacity of 450 fathoms of 10 mm diameter warp on each drum.

Navigational, communications and fish finding instruments will include a Decca 060 radar, Decca 150 autopilot, Sailer RT144 VHF radio, and a Simrad echo sounder.

Expatriates

"These first vessels will be commanded initially by experienced expatriates," said Mr. Bennett. "For the successful introduction of the commercial boats, however, local skippers and crews will have to be trained and the shore facilities vastly improved. We have made proposals for practical training courses in the use of radar, echo sounders and so on, and plans for improved shore facilities are advanced."

In addition to the 10-metre vessels the WFA is preparing proposals for the introduction of smaller glassfibre boats for working close inshore, and for steel vessels of between 20 and 24-metres which would be able to stay at sea longer and fish in deeper water.



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PORTS & MARKETS

Cochin cold store

INDIA'S Ministry of Agriculture has approved proposals from the Marine Products Export Development Authority (MPEDA) to set up a 500-ton cold store in Cochin on the south-west coast and another of 300 tons capacity in Calcutta. The National Dairy Development Board is to erect them on a turnkey basis.

Because of delays in developing fishery harbours, the MPEDA is to provide emergency landing facilities in some ports. Cemented landing platforms are being considered for centres in several coastal states.

Record year for Norway's sales...

but rising costs pose new threat to exports

DESPITE the strong position of the kroner in relation to other currencies in 1977, Norwegian fish exports were not priced out of world markets.

As reported in February *FNI*, sales jumped from £307 million in 1976 to a new record £401 million last year. And the prospects for 1978, with the recent devaluation of the kroner and a good season for winter cod, are regarded as good.

Reports from Norway point out that there has been a steady

rise in the market for frozen fish and, equally important, it appears to have become more stable.

During 1977, exports of processed fat herring totalled 3,300 tons worth almost £2.3 million. Most of this went to markets in Sweden, Finland and Denmark.

The year saw record sales of Norwegian fish meal and oil, with sales up by about £30 million to £160 million.

There are looming problems in some export markets, however, and the Nordic group (second largest

exporter) has warned that future expansion in the United States is threatened by mounting costs of production.

Sales by the group in 1977 were worth almost £40 million. Land-based freezing plants shipped out 22,000 tons and its factory ships 15,300 tons. These ships deliver their fish in the United Kingdom, whose imports from members of the Nordic group in 1977 amounted to 24,800 tons, worth about £25 million.

In another Norwegian export venture, Brodr. Jørgensen A/S of Alesund flew 78 tons of klipfish to Mexico to ensure that sufficient supplies of salt fish (bucculatio) were available during the Easter festivities.

This is the first time that air freight has been used to transport klipfish across the Atlantic. It was sent in four trailers by road from Alesund to Belgium. From there, it was flown over in two chartered Boeing 707 aircraft.

A group of Mexican wholesalers paid in advance for fish and transport.

Despite the many outlets, Norway is also giving some of her fish away — to developing countries. Over the next two years, she will contribute fish worth about £17 million to the United Nations World Food Programme.

News in brief

First for eels

EEL producers in Taiwan are finding their way into a new and promising market. The first ten tons of a 50-ton order for frozen eels (placed in September 1977) was landed in Hamburg in February.

The order was agreed between a Taiwan sales mission and German importers. It is reported to be Taiwan's first sale to a European country.

Freezer space

THE state-owned Shipping Corporation of India (SCI) is to operate two ships a month with freezer space to carry seafood exports from Cochin to Japan.

Each ship will have 50,000 cu. ft. (1,416 cu. m.) of refrigerated capacity for frozen products such as shrimp. Transport will also be provided for seafood exports from the west coast port of Mangalore.

In co-operation with Seafish Steam Navigation, SCI has also started a monthly service from Cochin to the United States.

Ecuador contract

THE British firm of consulting engineers, Rendell, Palmer and Tritton, has been awarded a contract for the design of fishing ports at Manta and Posorja in Ecuador. The framework for port facilities will cost an estimated US\$5 million, with a further \$25 m. to be spent on associated industries.

Process plant opens in Chile

A JOINT Swiss-Chilean company, Alimentos Philroy (Chile) Ltda., has just opened its new processing plant. Under construction over the past year, the factory is near the Bay of Concepcion in Talcahuano.

On the plant site are several new buildings, including an unloading area for fresh fish and shellfish, a filleting and packing room, freezers and administrative offices.

Date to go metric

JANUARY 1981 has been set as the tentative date for the metric conversion of Canada's fishing industry. The conversion plan has been drafted and is to be presented to members of the industry for their comment and approval.

The plan identifies 12 main "activity areas" in the conversion process. They include measurement units, production processes, equipment, marketing, training and public awareness.

Alimentos Philroy is licensed to freeze loques (Chilean abalone), merluza (hake) and jural (jack mackerel). Loques, which are selling well in Japan, are being sold to Japan by the company's first agent. This will be followed by frozen fish fillets for European and US customers.

HULL ENDS ITS ICELANDIC LANDINGS BAN



ANOTHER hatchet in the Britain-Iceland "cod war" over the fishing limits was quietly buried in March when the Icelandic trawler Valthor came into Hull to land a 65.5-ton catch which sold for £28,276. Included in the landing was just over 40 tons of cod which sold for an average of £438 a ton. A few days later the 385-ton stern trawler Dagny came in to land 112 tons which earned £84,756.

With Grimsby and Fleetwood, Hull was badly



affected by the Icelandic ban on British fishing inside the 200-mile limit. At all three ports stovesdore over a year ago refused to handle fish from any Icelandic ship. Last month the ban was still in force in Fleetwood and

Grimsby, but Hull staved off the ban on long enough. Despite protests from local trawlermen, they disengaged the ships, and merchants and process plants ashore received supplies.

The small trawler Valthor lands 65.5 tons to end the ban on Icelandic landings

First, get it right at home

IT WAS pointless sending missions abroad to promote seafood exports if producers at home failed to meet international quality standards. This was stressed by Akbar Musti Khun, president of Pakistan Seafood Industries Association, who travelled to Europe recently as a member of an EEC-sponsored Pakistani trade delegation.

Port scheme — Bank asked for aid

THE INDIA government is looking for financial aid from the World Bank for the second stage of the fishing harbour being built at the east coast port of Visakhapatnam. The amount required is Rs 63.3 million (about £4 million).

On the west coast, the government of Kerala has submitted to New Delhi its final report on the second stage of the Vizhinjam harbour project. This includes second-stage construction of a breakwater and associated structures at a cost of Rs 23 m. Also needed is the development of a fleet of 260 more boats.

Construction of a harbour at Dhamra in Orissa state is nearing completion and mechanised boats are being operated from it. But central government approval is still awaited for building harbours at Paradeep, Astarang, Sengtarapur and Gopalpur. With a coastline of 480 km and a continental shelf of 25,000 sq. km, Orissa contributes only 1.5 per cent to India's fish catch.

Many seafoods, he said, had unlimited markets, but Pakistan exporters should not compromise on quality.

In Europe, he had found considerable interest in the possibility of buying fish and shellfish from Pakistan. There were bright prospects for selling Pakistani fish meal and dry fish in France and Italy.

But in almost every country he had come up against complaints about quality and poor delivery performance by Pakistani exporters.

Interviewed on his return, he said he was also concerned over the state of the fish processing industry in Pakistan. Three plants had closed in 1977 and two more during the past few months.

These two belonged to a Pakistan-Japanese joint venture, and one had been the winner of an export award.

Plants that had closed represented about half the total installed processing capacity in the country. And he feared that another three plants may join them.

Exports success

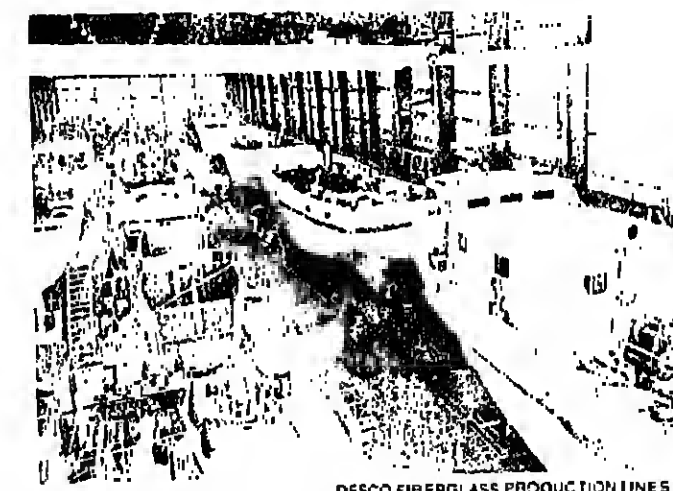
FISH exports from the Philippines in the first nine months of 1977 showed a growth of 17.37 per cent in volume and nearly 30 per cent in value.

Earnings from 23,191 tons in January-September earned US\$37.32 million. In the whole of 1976, exports totalled 28,065 tons.

Estimates for 1977 indicate that fish exports were probably around 34,000-35,000 tons. The main outlets were the United States and Japan.

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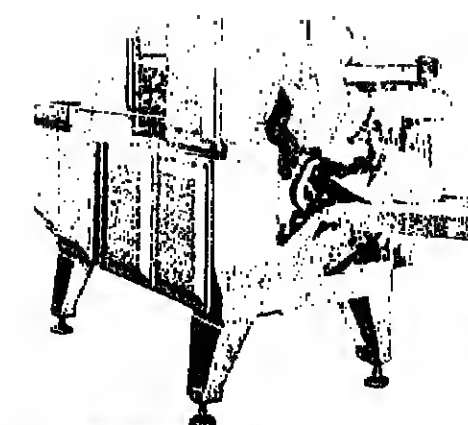
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THE MINI FISHERMEN



Subsistence fishermen working a communal trap fishery, on a large Central African river.

by Dr. ANDRES von BRANDT

LAST MONTH in Part One, I explained how subsistence fishing could be divided into four broad groups, each of varying levels of technical effort.

These levels range from gathering of aquatic animals or plants to methods employing simple tools, traps or hooks. Application of more technically advanced gear assumes the ability of the fisherman to purchase it and to maintain it in good order; also the technical ability to use such equipment effectively.

In this category, we might include netting traps, scoop nets, stow nets and hand-towed dredges; also lift nets, falling (cast) nets, small seines pulled manually between two poles and drive-in nets (which require co-operative effort). Finally, there are gill nets, tangle nets and trammels, of which gill nets are the most significant in subsistence fishing.

Also, gear for this fishing may be simplified for ease of transport, handling and repair — probably by one man. They may even be "slightly illegal" poaching nets.

Lack of size or complexity may often be more than compensated by the fisherman's superior knowledge of the habitat and the behaviour of his quarry — a type of knowledge which tends to increase as methods become more highly developed.

Large-scale gear cannot be operated in a subsistence fishery, and this applies also to permanent static devices which require constant supervision. One possible exception may be the stone walled weirs found in tidal waters in which fish may be stranded on the ebb tide — a method so old that it has been described as a "living fossil of the oldest fishing gear."

Labour

Subsistence fishing is based on cheap and plentiful labour, which is why it can survive as a personal-use fishery despite efforts at mechanisation.

Although fishermen work as one-man units, this does not prevent them working in groups, each with his own gear, such as a cover pot, or cast net.

The beginning of collective fishing may be the communal building of a stone weir, or driving fish into a jointly operated net. The gear may be jointly owned — for example, individual drift nets or lines within a fleet, or multi-bagged seine nets, in which case each gear owner may receive the catch made by his section.

One of the features of subsistence fishing may be the division of labour according to sex and age. For example, women and children may be restricted to the gathering of food along the shoreline, perhaps plunging for fish in the manner of the original Japanese Amas; or using

simple fishing gear such as hand lines, scoops, lift nets and cover pots — but not cast nets.

Whenever the fishing method involves swimming, diving or the use of a boat, or whenever greater physical strength is required, this is work for men. Likewise the "hunting" methods for catching large fish using a spear, harpoon, bow and arrow or blow pipe.

Body power

The same applies to multi-hooked lines, large nets and cast nets, which may require more body power to operate them. Sometimes older men, no longer able to operate such gear, have a special dispensation which allows them to use methods normally forbidden to younger men.

Old men may also be among those experienced in netmaking and repair, which is often a matter of ritual and forbidden to women. But the use of manufactured netting is spreading into the subsistence fishery, though such netting may not always be suitable for its purpose.

Flooding

In the many subsistence fisheries which depend on the periodic flooding of low ground, fishermen may cover more area by wading and swimming, though such operations may be limited by low water temperature, even in the tropics. A wading fisherman can search for fish in the sand or mud with his foot, while a swimmer can tow trolling lines or lay set lines, gill nets and tangle nets in deeper water.

Sometimes a net is rolled around bamboo poles for easy transport by a swimmer, who

Many subsistence fishermen go into the water for their catches. Here, a fisherman in Hungary clears his coverpot.

PICTURE: E. SOLYMOS

THE BIGGEST MAY NOT ALWAYS BE THE BEST

anchors and sets the net by diving. The catch is placed in floating pots, on rafts or in accompanying boats.

Lines can be set from a bench by casting or even by towing them out by means of a kite when the wind is offshore — a method known both in Europe and the Far East.

Carrier boat

The use of uncillary equipment in swimming and diving is rare, possibly due to cost and because there are times when even a simple raft will hamper a fisherman. But in non-tidal lakes and channels they can serve a useful purpose. A manually propelled boat can extend fishing possibilities, as when a large group of some ten swimmers may be accompanied by a boat carrying the net and the catch — but not the men.

Rafts and huats can be used in a subsistence fishery only when they are easily and cheaply obtained. Bamboo makes ideal material for rafts, but bamboo of sufficiently large diameter is becoming scarce in some areas and in Taiwan tubes of PVC have been used as a substitute.

Where rafts have to land on a surf beach, a flat bottom is necessary, which does not make for good handling. Canoes are better, but they may be heavy and need many people to manhandle them into and out of the water, so that many subsistence fishermen use "boat substitutes."

These may be boxes, barrels or, in Thailand, boxes made of expanded plastic. In such cases, hand or leg propulsion is the rule, though motorised rafts are used in Ceylon, India and Taiwan.

Next stage

Subsistence fishing can sometimes be developed beyond its basic personal-use level into a small-scale production fishery — subject, of course, to proven resource availability. The problem then is to introduce new materials for gear, new and improved fishing methods and assistance in the purchase or construction of suitable boats or canoes.

All too often, the subsistence and small-scale fisheries are in need of proper advice and assistance when purchasing materials; all too often it is a matter of buying whatever is available. This is often low quality synthetic yarn of sub-standard strength; monofilaments of poor transparency; netting of incorrect yarn and mesh size; and floats of the wrong type or size, sometimes cut down from old floats found along the shore.



Not all subsistence fishermen have three stalwart sons to help move a big net. Type and size of gear may be determined by the ability to transport it.

PICTURE: FAO

Certain traders appear to specialise in such unsatisfactory materials the result of which is often a hodge-podge of different materials and mesh size. On the West African coast, knotless netting has even been supplied as gillnetting!

It should be the responsibility of the fisheries administration to show fishermen how to avoid these

pitfalls, preferably by making their own nets. This could be encouraged by making yarn — not made-up netting — the subject of preferential tariffs. I might add that a far greater flexibility of fishing gears can be achieved by making up one's own nets from yarn.

When netting is imported, however, at least six to ten per cent. extra material should be added for repair purposes.

Care must also be taken to ensure that fishermen are buying the correct size and type of float, or the gear can be made ineffective.

Such simple precautions are important, for they help to keep subsistence fisheries healthy and thus they may become the basis for even more important small-scale production fisheries.



Simple fishing at its simplest. While two men in this Turkish river boat beat the surface, a third holds a scoopnet underwater to catch the fish.

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Scania is around where the 80's are planned

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Where others only deliver engines, Scania also delivers long experience and know-how. To Scania it is more important to offer the proper solution than just to get an order.

Scania is around when the ships of the 80's are taking shape on the drawing board. This ensures that a Scania diesel is always perfectly adapted to its duty.

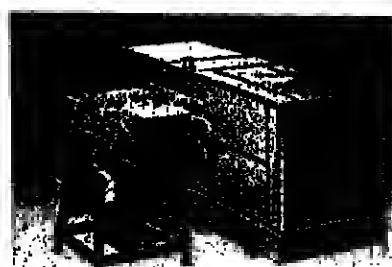
Ships like liners, tankers, freighters, tug-boats, fish-

ing-boats or ferries all over the world have Scania diesels for power. Scania diesels are used in single and multi engine installations for propulsion, cranes, pumps, gensets and other kinds of equipment.

Whatever the combination, Scania diesels are powerful and reliable. And most important of all, they are built all through for marine use.

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Boats are simple and small. Turkish fisherman migrating blue fish in the Bosphorus.

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PANTHER/Nokalon screw floats



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Easy to screw directly on to the net.

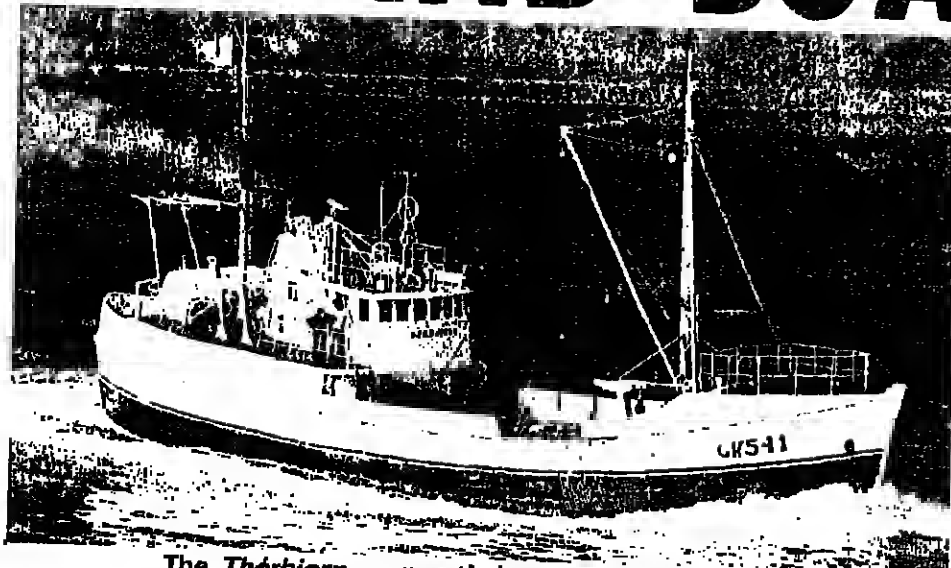
When screwed on, firmly secured.

Write or call for further information, also about Panther/Nokalon's other fishing equipment.

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NEW ENGINE FOR ICELAND BOAT



The Thorbjorn... greatly improved performance

FISHING vessels are among the work boats in European waters which are providing a growing market for the new-generation Cummins K series diesel engines.

"The 19-litre KTA-1150-M straight-six and the 37.7 litre V12 known as the KT 2300-M are proving worthy companions to engines like the well-tried VT-1710-M in our range of marine units," says Cummins.

One interesting trawler installation of a KT-2300-M is

the 131-ton Icelandic vessel Thorbjorn, operating from the Vestmanna Islands.

Replaced

This vessel is 13 years old and her owner, H. Thorkottustada, decided the time had come to replace her original 600 hp engine. Having previously operated two boats with Cummins engine, he chose the new 700 hp V12 unit.

Repowering the vessel involved a change in the engine room foundations and re-routing the exhaust system. The Icelandic agent, Bjorn and Helldor, produced a

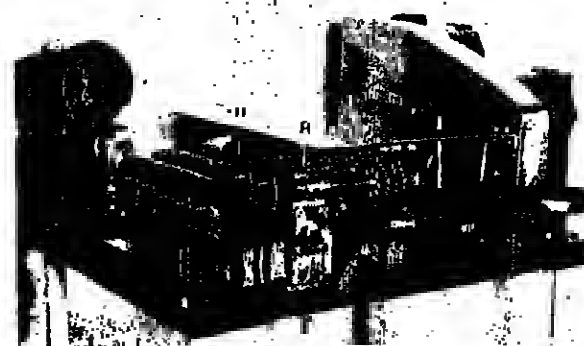
special front-end power take-off. Through a Twin Disc clutch, the PTO drives the vessel's hydraulic winches. With her new engine, the free-running speed of the Thorbjorn — at 1,800 rpm — has increased by more than 10 per cent to 12.2 knots.

An example of Cummins repowering of a smaller vessel is a 75-ton mussel boat in Holland. This boat — the BRU 14 — had her 240 hp engine replaced by a KTA-1150-M unit developing nearly twice the power — 470 hp which gives her a speed of up to 11 knots loaded.

This boat was re-engined following lengthening of her hull to 28.5 metres.

product news

METHODS • GEAR • EQUIPMENT
PLANT • COMPANIES



Sardine scaler

A MACHINE to scale sardines without damaging the fish has been introduced by General Fish Machine Company of Wakefield, Massachusetts.

It automatically adjusts to the size of each fish up to 3 oz. (84 grams) in weight. To assure a high quality finished product, it will not cut the fish or damage the skin. It processes 60 a minute by hand and up to 200 a minute when linked to an optional feeder.

The machine is made of corrosion resistant materials. Scales are of PVC with stainless steel knives. Gears are bronze and oil bearings are equipped with Alemite fittings.

Mounted on a hot-dipped galvanneal frame, the machine is powered by 0.5 hp waterproof electric motors.

Further information from General Fish Machine Company, 105 Foundry St., Wakefield, Massachusetts 01880, USA.

Chileans consider Autoline

THE FIRM O.Mustad of Norway has been showing interest in introducing its Autoline system to vessels in Chile.

Gear technologists in Chile and a number of people in fishing companies feel the system could be used particularly in fisheries for the conger (cusk eel), corvina and sierra as well as for several species of bottom fish not easily reached by trawls.

It might also be adapted for some of the under-utilised species such as grenadiers and sharks.

Another possible use might be in areas such as south of the 39th parallel where the harsh weather inhibits fishing, but where there are resources that might be able to support some substantial fishery industries.

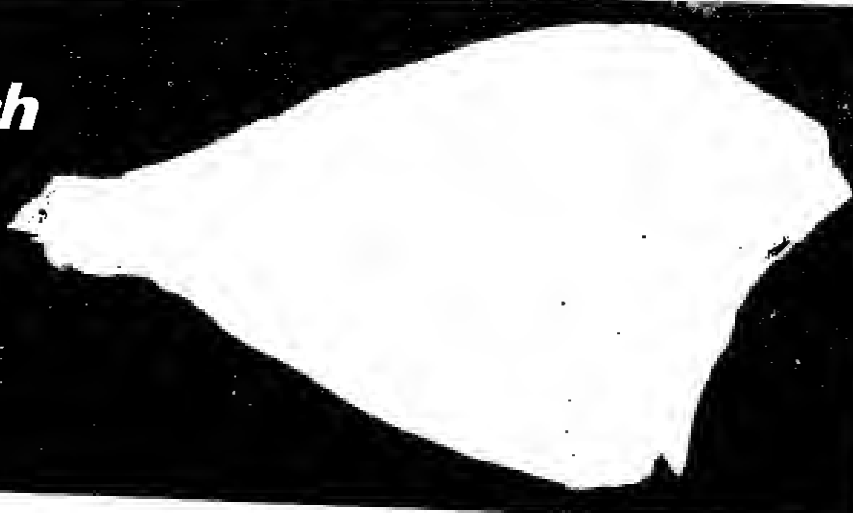


USING a 100 ft. Cosalt Concord trawl the 68 ft. (20.7 metre) long Grimstby-based Victory set a new record last month for an inshore haul of her class. She landed a catch of 16.3 tons to earn £7,345. With this haul, the boat, owned by Tom Wulkey,

had broken the record three times in four trips. "In the Victory," said Wulkey, "we have the combination of a first-class crew using a first-class trawl and that is how they keep breaking records."

TELOMEX DRIVER

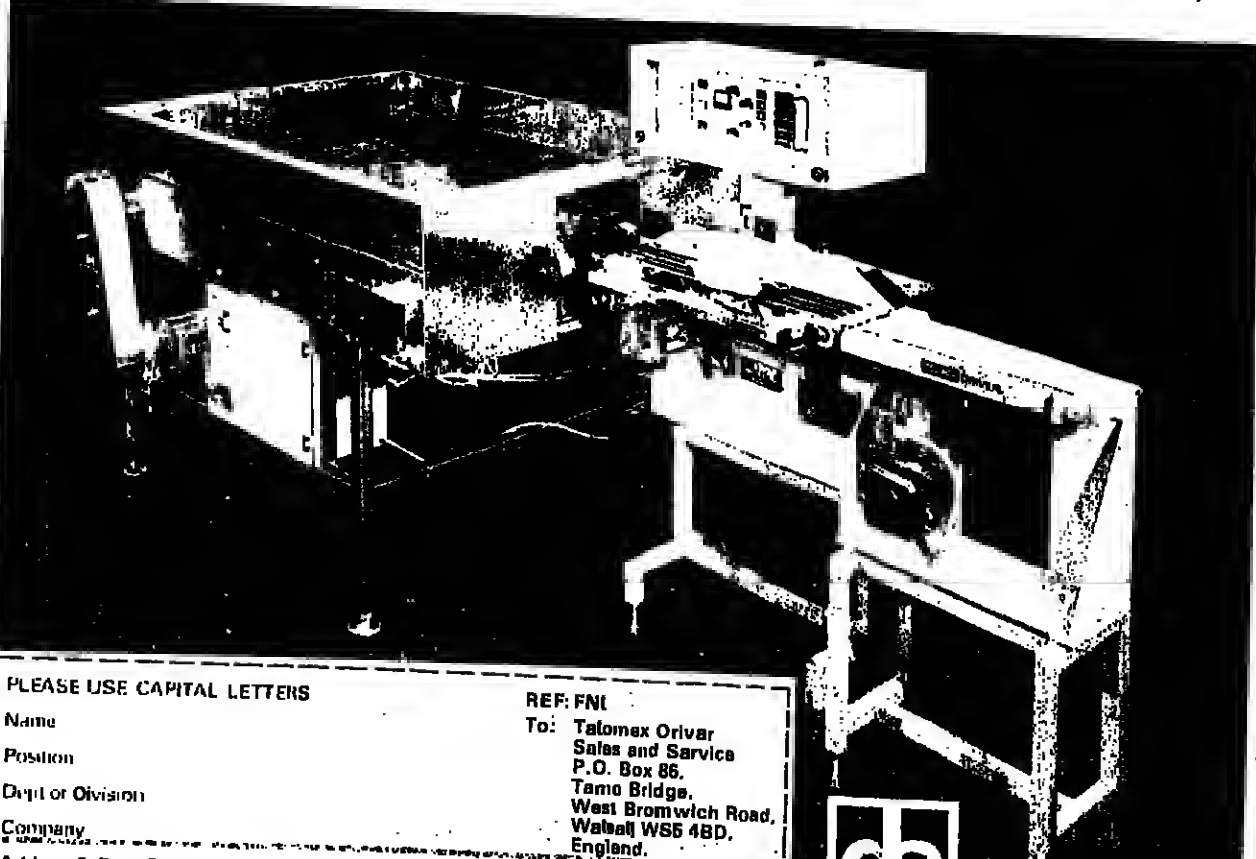
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This enables you to make up your pack weight accurately and quickly. The weight levels are easily set and are variable to suit the size of product you are handling. The complete system only requires 3m in which to operate and can work either independently or as part of a fully automatic processing/packaging line.

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Factory change

THE marine division of R. A. Lister & Co. Ltd. has moved to new premises at Goodridge Avenue in Gloucester, England. It will trade in future as R. A. Lister Marine. Initially, the new plant will have 75 employees working in a 5,017 sq. m. factory which has increased capacity for assembling, testing and packing. Lister Marine's propulsion and auxiliary engines go up to 250 bhp.

"This move represents a major step forward in our development and will enable us to meet the increasing demand for engines and generating sets from our customers and distributors throughout the world," said Ted Spash, general manager of R. A. Lister Marine.

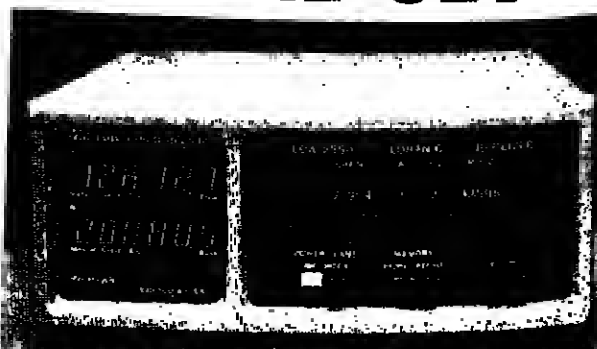
NEW TRAWLERS FIT MARCONI

FOUR NEW 79 ft. (24 metre) compact stern trawlers being built for Boston Deep Sea Fisheries in England are being equipped with communications equipment, fish finders, talk-back and entertainment systems and liferaft transceivers by Marconi Marine.

The vessels, building at Richerds (Shipbuilders) Ltd.,

Lowestoft, are having identical installations. Each will have main communications facilities based on a 400W single-sideband radio telephone crystalised for operation on 11 transmit frequencies and 14 receive frequencies. A Chubbuck Marine transceiver will provide emergency liferaft communications facilities.

SIMPLE SET



MORROW International Inc of Salem, Oregon, claims that its new model LCA-2950 is the "most simple-to-operate Loran-C set on the market." Described as a fully automatic acquisition and tracking dual Loran-C, the LCA-2950 features simple one-button operation, high accuracy and fast acquisition and setting time of up to 120 seconds under normal marine navigation conditions.

It displays two LOPs continuously and simultaneously for faster cross fixes. Digital LOP readout displays are half-an-inch tall, amber gas-discharge type. Power consumption is a low 18 watts.

The 2950's internal memory circuits have "store and recall" modes. Morrow claims it is the first to offer this feature. The unit also incorporates blink identification, and both internal and external notch filters.

Compact, lightweight and modular in design, the 2950 has all control switches in full operating view. It is provided for marine output compatible with Morrow's optional RDR-12 receiver.



AN AUTOMATIC hydraulic release unit for inflatable liferafts, developed by two British companies, has passed intensive tests and has now been approved under the relevant regulation of the International Convention for the Safety of Life at Sea, 1974.

The unit is made by Bervyn Engineers and the Certificate of Inspection and Test has been issued to Beaufort Air-Sea Equipment Ltd.

This follows trials of the unit in three years at sea aboard a fishery protection ship, and exhaustive physical testing by the Department of Trade.

In a typical installation, the Beaufort/Bervyn unit is fitted between a senhouse slip and a shackle secured to a deck plate. If the ship sinks, the release is operated automatically by water pressure at a pre-set depth.

This allows the liferaft to come to the surface and inflate as the painter line is paid out. A weak link in the system avoids the risk of a liferaft being dragged down with the sinking ship.

As reported previously in FNI, there will be substantial changes in the way these engines are distributed among Sri Lankan boat owners.

The units purchased are three-cylinder model D3.152 engines with a special rating of 36 bhp at 1,800 rpm. They will be installed in 26 to 28 ft. boats.

Since the late 1950s, Perkins product training school instructors from the United Kingdom have gone out to Sri Lanka to help familiarise boat crews with their engines.

"Sri Lankan fishermen," said John F. Bailey of Perkins, "have shown a strong preference for the Perkins engines because of its fuel economy and its smoothness to operation. This has also no doubt been helped by our comprehensive training programme."

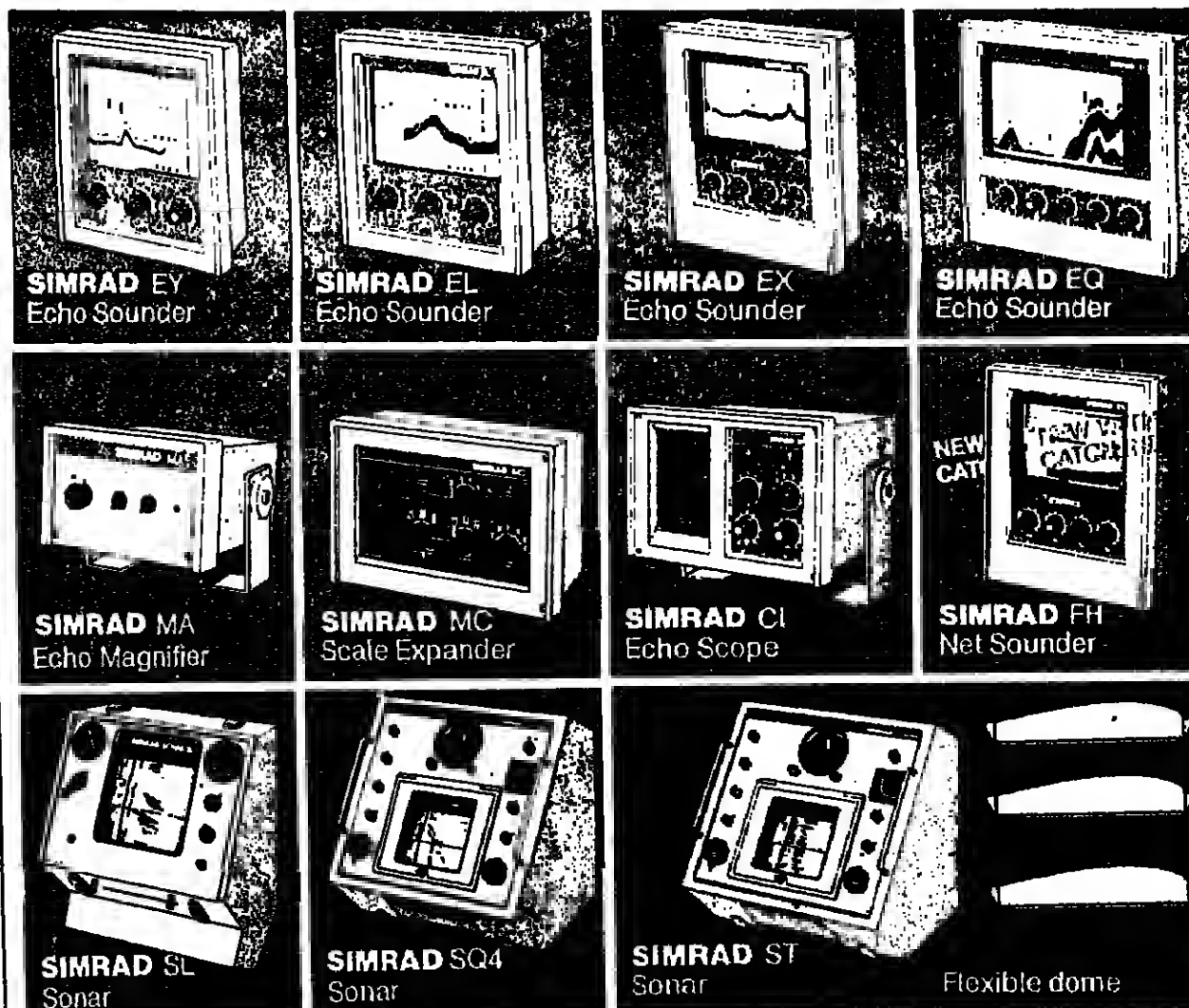
A growing number of countries in the world's developing areas were closely watching the development of Sri Lanka's fishing fleet modernisation programme.

"Perkins can also point to fleet mechanisation successes in Tunisia, where we are helping to transform traditional fishing practices with outstanding results," he said.

Rope guide

THE range of mooring lines available from British Ropes Ltd. is listed and described in a new 24-page brochure.

Included are ropes of man-made fibres and steel wire ropes. Fittings and sundries used with mooring lines are also catalogued. Handling, care and maintenance of rope is outlined in the brochure, which can be obtained from British Ropes, Carr Hill, Doncaster, South Yorkshire DN4 8DG, England.



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The books page

NAVIGATION AIDS FOR SMALL BOATS

The sea, fish and ships

THE Sea Must Live is the theme of the latest issue of the Council of Europe's nature conservation magazine *Naturps*.

Alan Preston of the Marine Laboratory in Lowestoft considers fish stock management in an article titled "The last herring." One of his conclusions is that at the levels of marine pollutants presently found in the north-east Atlantic "it is unlikely that any deleterious effects exist."

Published in English, French, German and Italian, this issue of *Naturps* (No 29) is available from the European Centre for Nature Conservation, Council of Europe, 67006 Strasbourg Cedex, France.

**No-nonsense
no-jargon
guide by
a seaman
for seamen**

FISHERMEN have learnt to become wary of books purporting to be guides to their equipment. All too often they are written by engineers talking incomprehensibly about modules or back-up circuits; or they are by technical writers drawing heavily on sales literature put out by manufacturers.

Neither of these criticisms can be made of *Electronic Navigation for Small Craft*. Dag Pike, its author, is a ticketed deck officer who is also an expert in small craft navigation. As a technical journalist (and a regular contributor to *FNI*), he is able to write simply and clearly.

He also has knowledge of commercial fisheries to include much of interest to fishermen in a book reaching to a diverse group of boat owners.

Echo sounders

The section on echo sounders should be read by fishermen in the context of navigation, not fish-finding. Since here the emphasis is on wide beam transducers to increase ground coverage and reduce errors caused by roll and pitch.

Dag Pike has some interesting comments to make on the "electronic" north-sensing compass, and he believes this has a role, outside the usual one of autopilots.

On radio navigation, there is good coverage of RDF and Consul for those not blessed with Decca or Loran, and this is also well explained. The author has a warning for us against the apparent accuracy of three places of decimals provided by certain systems, especially Omega — this is only an accurate computation of the input, which may be subject to considerable error.

He views satellite navigation with favour, however, even for smaller craft, since accuracy is high and corrections are built into the signal; but dead reckoning between fixes must also be reliable, and in this context there is a useful section on both rotating and electromagnetic logs.

Well produced

Few fishermen will fail to benefit from Dag Pike's new book — and this is an area in which knowledge is safety. It is not a product buyer's guide, although there is a final chapter titled "Value for Money."

Electronic Navigation for Small Craft is well produced and illustrated, has 150 pages and an index. It is published by Adlard Coles Ltd., Granada Publishing, St. Albans, England; price £10.00.

**Oil spills
who
are
the
real
culprits?**

OIL POLLUTION and its spill have become emotive words, as wells, rigs and pipelines proliferate due to or even on fishing grounds. Future planning, however, needs facts, not emotion, and this is what Woods

Oceanographic Institute in the United States has tried to assemble in the Autumn edition of the magazine *Oceanus*.

In it, 12 members of the scientific staff examine various aspects of what is to be only a temporary embarrassment to the environment, or something more permanent and dangerous.

Record straight

The magazine puts its record straight as to what really does the polluting. At only four per cent of the annual six million tons that reach the sea comes from tankers and oil well blowouts.

A major part — 30 per cent — comes from transport operations, but most of all — 44 per cent — is due to industrial and domestic waste draining from the land to rivers, with another 10 per cent from fall-out.

700-page survey

OIL IN the sea is given a special chapter in the 700 pages of the book *Marine Pollution*, the most comprehensive of recent years covering this vast subject.

A compilation of the writings of several authors, it is edited by R. Johnston of the Marine Laboratory in Aberdeen, Scotland, who also contributes the 156-page chapter on the effects of pollution on commercial fisheries.

Also considered are heavy metal contamination, sewage in the sea, measurements and legal aspects.

Published by Academic Press in New York and London Price £23.40.

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walkabout talkabout

with Arthur J Heighway



NORWAY'S fish farming production of salmon and rainbow trout is notable so that a detailed and authoritative work under the title *Salmon and Trout Farming in Norway* is a welcome forthcoming addition to the list of Fishing News Books Ltd.

The 1977 output earned ex-farm, the equivalent of £10 million, most of it being exported to EEC countries whose appetite for both fishes is so considerable that prices run consistently high and the protective duty of four per cent for their own fish farmers is not even applied to imports. Under those favourable conditions Norway's industry has expanded and now has a bright future.

The author, Dr. David J. Edwards, is British trained and has worked on fish for many years. After being awarded a doctorate by the University of North Wales in 1971, he had four years' experience at Rolurua, New Zealand (a noted trout centre). Lute in 1975 he joined the Department of Animal Genetics and Breeding of the Agricultural University of Norway to work on aspects of salmon and trout culture — notably on selective breeding.

For the purposes of this book he mobilised, as is confessed in a generous acknowledgment, the practical experiences and academic skills of a formidable array of associated local talent so that this work attains high rank in quality and merit.

It contains 12 chapters; these range from the quality of water and the siting of the farm through to every aspect of culture: From that in fresh-water to net culture in seawater, and even sea ranching — to marketing, economics and "the future."

Every section is fully covered in text and amply illustrated with a total of 78 figures and 12 tables of supporting statistics. While a few sections of the book that are concerned with local economic and social factors, are of relevance only to Norwegian conditions, others, for example, climatic considerations, apply to all cool temperate regions.

With final production at last in sight — hopefully mid-April on latest advice from the harassed printer and bookbinder — our sales department, ever mindful of customer convenience, wrote to those with long-outstanding orders to say that although they may understandably have almost given up hope, the books were about to appear — but that in consideration of their unusually long wait their book would be supplied at a concessionary price.

This gesture on our part has brought many appreciative responses. One early one from France read: "You are quite correct in thinking I had given up hope of receiving that book. But it is a pleasure to find that there still exist organisations such as yours who consider customers as an important element for conducting business."

"Thank you for the special offer you have made and I am immediately instructing my bank to remit. If there are any further charges let me know. It is a pleasure doing business with you and while awaiting to receive my edition around mid-April I remain with kind regards very truly yours."

For our part we can only say it is nice to deal with such customers. We do lay ourselves out to give the best possible service to customers everywhere — particularly by prompt service. We greatly regret that the

address instead of Farnham, Surrey read Sarham Survey; yet the postal geni "surveyed" it properly and it reached us at t Long Garden Walk. In this lovely little country town we are good customers of the Post Office and we appreciate their service.

One of the most valuable and appreciated books we have published is the *Multilingual Dictionary of Fish and Fish Products*. This was the outcome of five years of assiduous and devoted work on the part of a team of scientists in many countries who co-operated in the basic enterprise of OECD Paris to provide a standard volume listing the scientific names of commercial fish and products and their equivalent names in 15 other languages of countries with well established fishery industries.

First edition

Time came for the first edition to be revised and re-issued. The literary work duly put in hand occupied a goodly period because of additions being required and the incorporation of names not previously available. These additions made a complete reprinting advisable. And because of current difficulties in printing houses in part occasioned by new technologies more delays accumulated.

With final production at last in sight — hopefully mid-April on latest advice from the harassed printer and bookbinder — our sales department, ever mindful of customer convenience, wrote to those with long-outstanding orders to say that although they may understandably have almost given up hope, the books were about to appear — but that in consideration of their unusually long wait their book would be supplied at a concessionary price.

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For our part we can only say it is nice to deal with such customers. We do lay ourselves out to give the best possible service to customers everywhere — particularly by prompt service. We greatly regret that the

special problems met with in re-producing this work occasioned so much delay.

Once in Rome when passing a small pyramidal monument I asked Jan-Olof Traning, FAO's skilled naval architect, what it was. His prompt reply dictated by his hard Swedish common sense was "I don't know — I don't clutter my mind with useless knowledge."

That reply came to mind recently when I heard a BBC announcer describe the coming of the feathers on a sparrow. It seems that in a nature quiz session a lad had asked how many feathers did a sparrow have? So someone had spent time in counting them — and in detail — per wing, breast, back, tail and legs. The grand total was 3,236; I don't remember all the detail but I do recall that there were only 50 feathers on the left leg and 81 on the right leg.

Now I can't assert that that information is completely useless. It might have a value to someone although momentarily I can't conceive the prospect, but I do know from my early training that there is psychological mind and eye appeal in perusing short items of factual information.

Catchy items

It was once in early days my task to compile such a column headed Omnium Gatherum. This consisted of one or two-sentence items of current interest mixed with hreivities of scientific or historical import. And interspersed among them would be small catchy advertisements bringing in revenue from the readers' lure of just such catchy items as the fact that the last sparrow unclothed had 3,236 feathers. But from that futile fact the best conclusion I can reach is that it would be quite uneconomic to start a feather pillow factory based on the catching of sparrows.

I am a confirmed believer in the value of striking a cheerful note wherever possible. And so I extend my admiration to the judge who handled with such sympathy the following case. A sad old lag who had appeared before him on many previous occasions was arraigned on an old familiar charge and the judge, rather tired of seeing him and thinking a goodly sentence would give him a chance of extended recovery, handed down the rather severe sentence of ten years!

Shocked, the old fellow murmured in a shaky voice "Your Honour, I don't think I can manage that."

"Well," replied the judge consolingly "just do the best you can."

Fish uses in the tropics

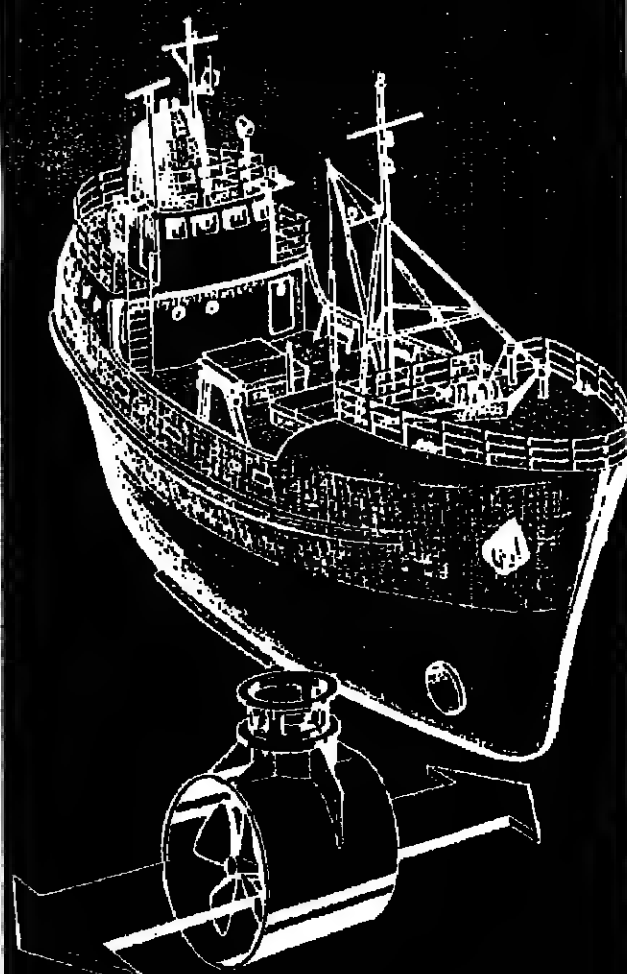
ONE OF the most useful, and successful, of fishery conferences held in recent years was that organised by the Tropical Products Institute in London in July 1976.

It dealt with handling, processing and marketing of tropical fish. Prepared in co-operation with FAO, it attracted some 200 participants.

These papers and the conference proceedings have been published by TPI in a large soft-cover book of more than 500 pages.

It is available (price £10 plus postage) from the Tropical Products Institute, 56/62 Gray's Inn Road, London

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Guide to the organisations

TO THE uninitiated, trying to sort out which international organisation handles which aspect of marine science, pollution problem or fishery development project is like assembling a jig-saw without a picture. But puzzles have their solutions, and there is a useful guide to inter-governmental organisations and the oceans. It was compiled last year by Harry N. M. Winton for the Natural Resources Division of

the Special Libraries Association. It is available as a 54-page paper (price \$4 with order) from UNIPUB, Box 433, Murray Hill Station, New York, N.Y. 10016.

The purpose of the paper, says Winton, is to indicate the extent to which inter-governmental organisations, in and outside the United Nations system, are concerned with the oceans. He also provides a comprehensive list of their many publications.

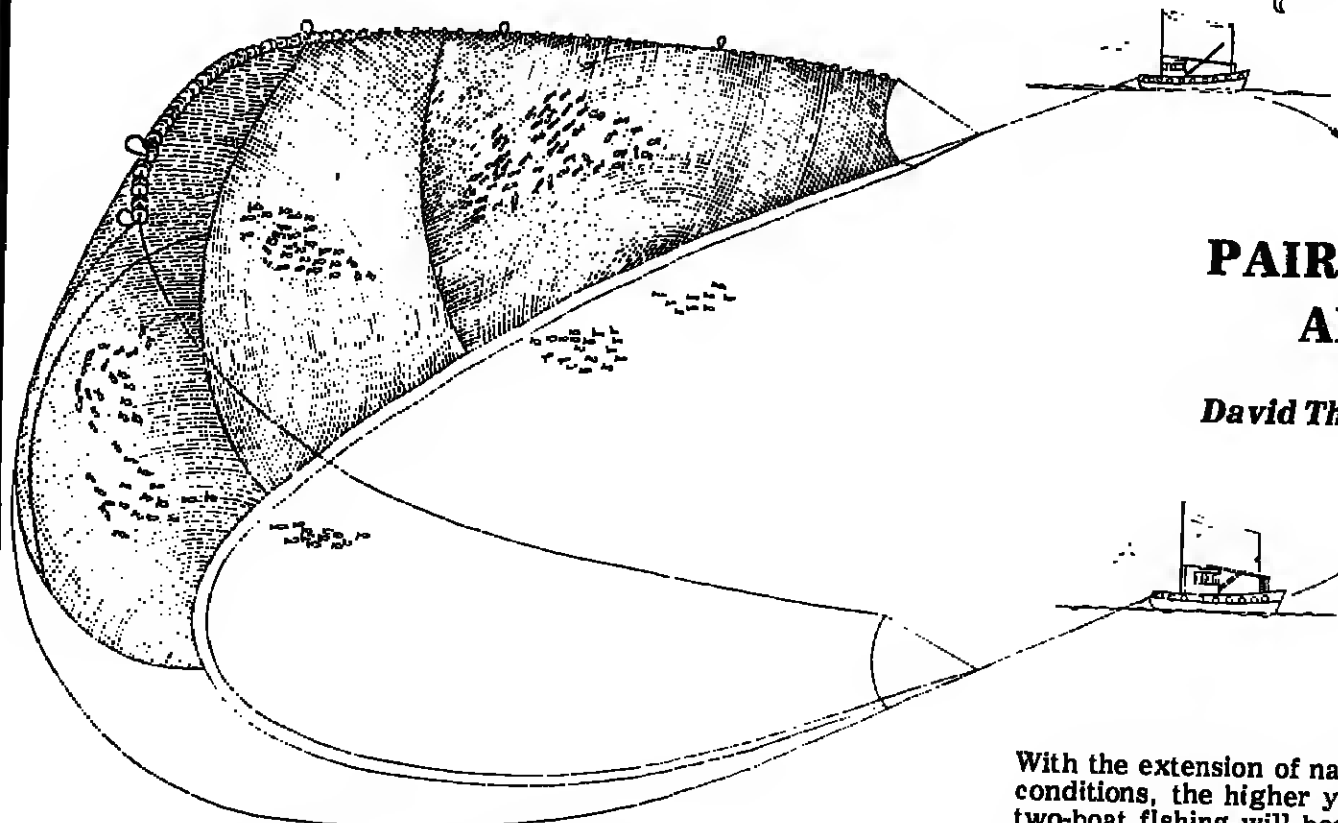
One of the largest sections of the bibliography deals with fisheries and with aquaculture.

It lists publications on fish stock assessment, fish processing and marketing. Within the UN system, FAO, the UNDP, the Asian Development Bank, IMCO and the World Bank are already widely known for their assistance to fishery industries. Winton outlines their functions, and also lists the bodies that have sprung from FAO to serve various regions such as the Indian Ocean, the Mediterranean and the Caribbean.

There are other agencies less obviously involved, including the International Labour Organisation, UNESCO, and the International Maritime Satellite Organization which has spawned from IMCO.

But, most useful of all his lists, is that of the bodies outside the UN. These include the Inter-American Development Bank, the EEC, the International Baltic Fishery Commission,

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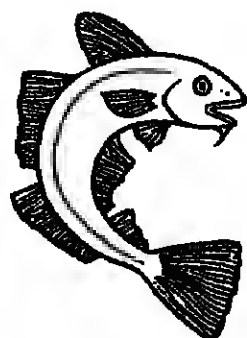
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THE PROCEEDINGS of a Conference on Fisheries mathematics held in Aberdeen, Scotland, in 1975 has now been published under this title.

A wide range of topics is covered, from the preparation by the White Fish Authority of Kingfisher charts using computer-aided cartography to studies of fish migration.

The main emphasis is on recent mathematical developments related to the management of marine stocks.

The book begins with a discussion of primary production in the sea in a chapter on plankton patches in the North Sea. It moves on to development of a stock model for a study of the dynamics of fish populations, and then to the growth, reproduction and mortality of gadoid species.

From these three chapters concerned mainly with the dynamics of natural fish populations, the book turns to the population dynamics of fisheries, with chapters on the estimation of fishing mortality.

The last part of the book considers mathematical aspects of fish behaviour significant in relation to catching.

The collection from the conference shows the diversity of fishery problems on which new light can be shed through a mathematical approach and the use of computer techniques.

Fisheries Mathematics is edited by J. H. Steele of the Marine Laboratory in Aberdeen and is published by Academic Press, London. Price £8.50.

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AN INDIAN LOOKS AT HIS OCEAN

The books
page

CONTINUED FROM 35

SINCE FAME came to the Indian Ocean during the International Geophysical Year, little more appears to have been achieved in assessing accurately its apparently enormous potential. Now that the 200 mile regime has become widely accepted, those states whose coastlines border the Indian Ocean are asking — with some justification — what they have acquired and what they can do with it in terms of exploitation.

Now, an Indian specialist in international law, Dr. Rahmatullah Khan, has taken a long, hard look at the problem in a new book, *Indian Ocean Fisheries: The 200-mile Economic Zone*.

Significantly, Dr. Khan spent what was apparently an exciting year at Woods Hole as a post-doctoral fellow in the Institution's Marine Policy and Ocean Management Programme (MP & OM).

It seems that this opportunity to interact with other scientists and other disciplines opened his eyes to more than the legal problems attendant on a 200-mile zone. There is

also the problem of conserving this huge resource.

To put the problem into focus, Dr. Khan tells us that one billion people — one third of all humanity — live round the Indian Ocean, and a high proportion of them are fishery-dependent. To some extent, this book is a plea for a better administration for what may well be the last of the world's major under-

exploited coastlines. It is very gratifying to find a study such as this reaching out to world readership.

Indian Ocean Fisheries: The 200-mile Economic Zone, by Dr. Rahmatullah Khan, 264 pages with index and references. Published by Ankur Publishing House, Uplour Chemo Building, Green Park Extension, New Delhi, India. Price \$12.00.

GEAR CHART AIDS

THE FISHING GEAR technologist John Garner has prepared a set of charts showing gear and methods. They are intended as a teaching aid for the industry.

The first chart shows a pelagic, high opening, four seam, single boat trawl with hydrofoil otter boards.

Chart No. 2 is of a deep-sea, bottom otter trawl for stern fishing.

The other charts include a box trawl for inshore fishing, a flat shrimp trawl and a standard type otter trawl with conventional boards.

Further information from John Garner, 2 The Link, Carlton, Nr. Gooke, Humberdale, England.

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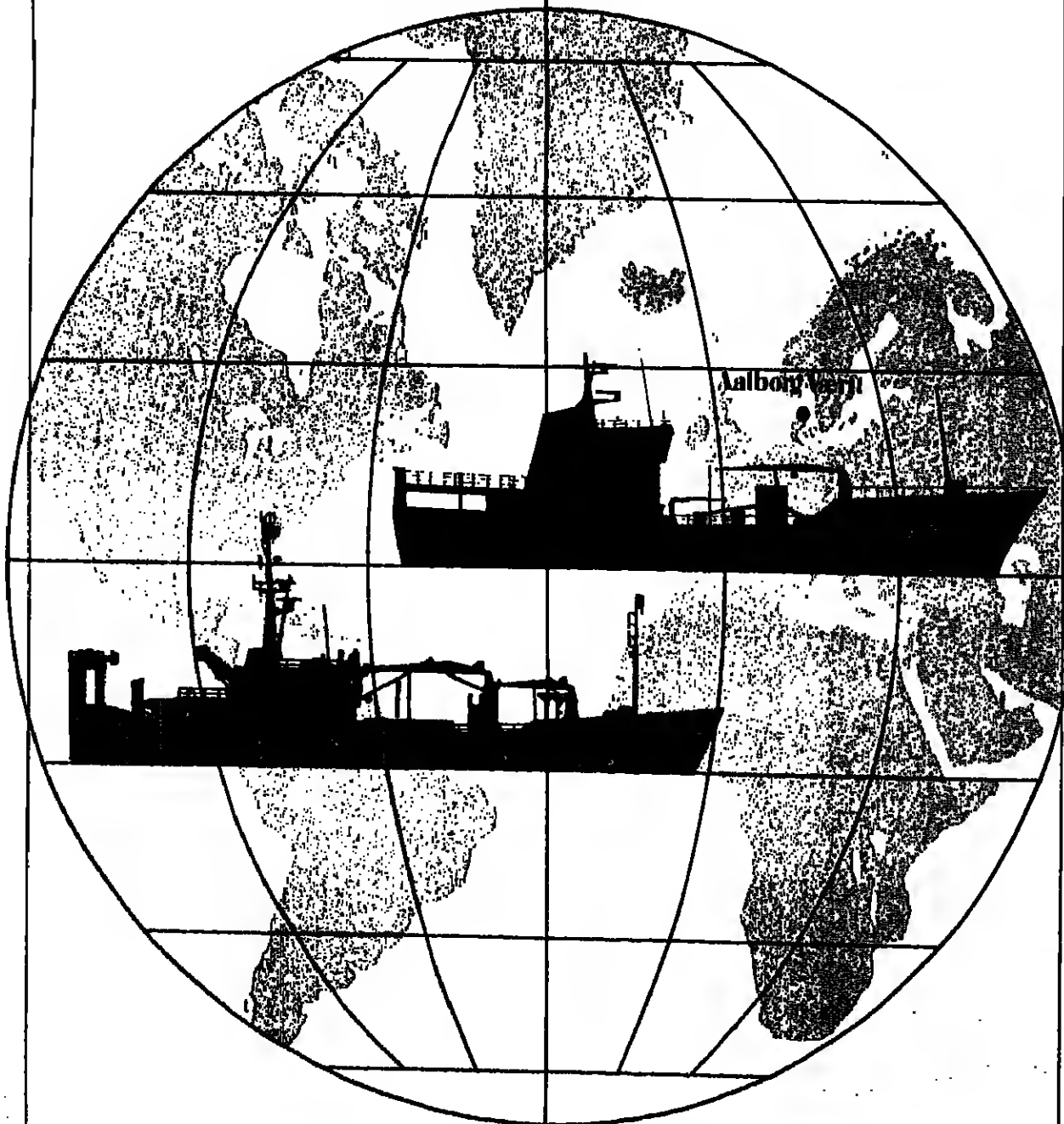
South Yemen

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IN AN effort to speed up development of their fisheries, the Government of South Yemen has leaped into industrialisation, being prepared to learn by trial and error and face the cost.

The start was made through joint ventures with the USSR and Japan and in deals with fishery interests in other countries. Commercial fishing began in Aden in 1971 with two Russian vessels.

There are now eight vessels in the project — three owned and two chartered by Yemen, two owned by the USSR, and one research ship.

Japanese

The joint venture with the Japanese licenses them to catch an agreed tonnage of cuttlefish and squid in Yemeni waters, checked by government officers. In return, the Japanese provide vessels, equipment and services to the value of the catch. They also buy cuttlefish and other species from the Public Corporation for Fish Wealth. The Japanese operated with three ships of 3,000 gross tons each.

Among the "leap into industrialisation" measures taken, the Yemenis bought a fish meal plant of 150 tons a day capacity in 1974. This, located at Mukalla, a main fishing centre some 400 miles east of Aden, is to be increased to 300 tons a day and supplied with sardines by boats bought for this purpose.

Seiners

Another big purchase has been that of a floating fish meal plant and seven vessels at a cost of some US\$15 million (see panel). The boats are two second-hand Norwegian vessels, the rest being new purse seiners.

Yet another fish meal plant (150 tons a day) is being built at Khorumeira, 150 miles west of Aden.

"We now have eight purse seiners with six more on order for delivery later in 1978," said Corporation executive Abo Wahab Sharaf. "We expect the 14 vessels to catch

The People's Democratic Republic of Yemen is one of very small number of countries which regard fish as their most important natural resource. It takes about 130,000 tons a year, but is looking to a catch of 360,000 tons. CEDRIC DAY outlined the fishing prospects of South Yemen in a special report in our March issue. He continues with a brief review of projects in progress or planned which will make this otherwise poor country one of the fishing leaders of the Middle East...

about 260,000 tons of sardines a year, yielding about 50,000 tons of meal and, of course, oil."

Needless to say, the operation of these plants has brought difficulties, as the Yemenis had no pool of experienced engineers and other technicians to man the plants. But, despite the problems and difficulties, progress has been made, with foreign assistance. As one FAO fish industry expert told me, "the Yemenis are working hard in the plants at all levels and they are learning fast."

Similarly, ventures into canning have faced various problems. For example, the Japanese-built plant at Shuqra has been restricted in operation by an early breakdown of machinery. Meanwhile, the USSR is helping to build a 15 million cans a year plant at Mukalla for packing tuna, mackerel, kingfish, sardines and other fish. The factory is scheduled to start production in 1978.

Bank loan

"Freezing and cold storage facilities are being set up. An international bank loan of US\$6m. is to be used to build an 800-ton capacity cold storage, with a 20 tons a day freezing and ice-making plant, in a fishing centre, and another 150 ton capacity cold storage plant at Shuqra, west of Mukalla."

The Chinese are also building an 800-ton cold storage plant, including capacity for freezing and ice-making, at Aden. It will have a workshop for engine repairs, a net-making shed and a stores. Earlier, the Japanese built a 100-ton capacity cold storage and ice-making plant under their cuttlefish agreement.

The Public Corporation for Fish Wealth is building a cold storage plant of about 1,000 tons capacity in Aden and is setting up 21 cold storage facilities along the coast.

Part two



OUR FAO correspondent Cedric Day—pictured above—began his career in journalism and later moved into senior administrative work as director of FAO's activities in Western Asia.

He began with a newspaper in Ontario, Canada, in 1929, moving to the UK in 1934 as a feature writer for Canadian papers. He then extended his activities to write for a number of publications in Britain. After serving in the Royal Navy during World War II, he edited the journal *Weekly World*.

In 1953 he joined FAO, where he rose to chief of features in its information division. Transferred to India in 1963, he was in charge of FAO work in an area that included India, Nepal and Sri Lanka.

Since retiring in 1971, Cedric Day has carried out several assignments for FAO. His reports in *FNI* are therefore based in recent observations, together with long experience of international aid projects in developing countries.

These are scheduled to be completed by 1979.

The Corporation is also acquiring some 20 refrigerated and insulated lorries, aided by a soft loan of US\$3m. and a \$4m. commercial credit from Denmark.

Even bigger development plans are being made for the future, including a scheme for constructing a new fishing harbour at Aden.

"We are also going to build a new harbour complex at Mukalla," Mr. Sharaf informed me. "This is already under construction and should be completed by the end of next year."

Headaches

Similar developments are planned for Nishtun, Bir Ali and Khor Umeira, as well as a series of shore facilities required by the fishing industry.

One of the biggest headaches of the government of South Yemen is the scarcity of manpower. It is not only a shortage of highly trained and skilled technicians and executives but a shortage in all categories.

This is due in part to the small population and the demands made by ambitious programmes of industrialisation. There has also been a heavy drain of labour to the neighbouring oil-rich states. While these migrant workers send back substantial foreign currency, their absence is impeding national development and so migration for work abroad is now controlled.

Industrialisation of fisheries calls for training at all levels. The Fisheries Training Institute in Aden, the National Technical Institute, and a Co-operative Education and Training Institute, cannot meet the present and projected requirements in fisheries. Larger and better equipped facilities are being set up.

These will provide training in navigation, engineering, refrigeration, food processing

and hygiene and maintenance of all kinds. It is hoped that outside sources will give assistance with this development, with FAO's Indian Ocean Programme providing advice and technical assistance as required.

In these circumstances, the liberation of women is of critical importance in South Yemen as a substantial contribution towards solving the labour problem.

Looking ahead to the problems of fisheries development to be faced in the second five-year plan (1979-84), the President of the Republic recently listed the priorities envisaged by the government:

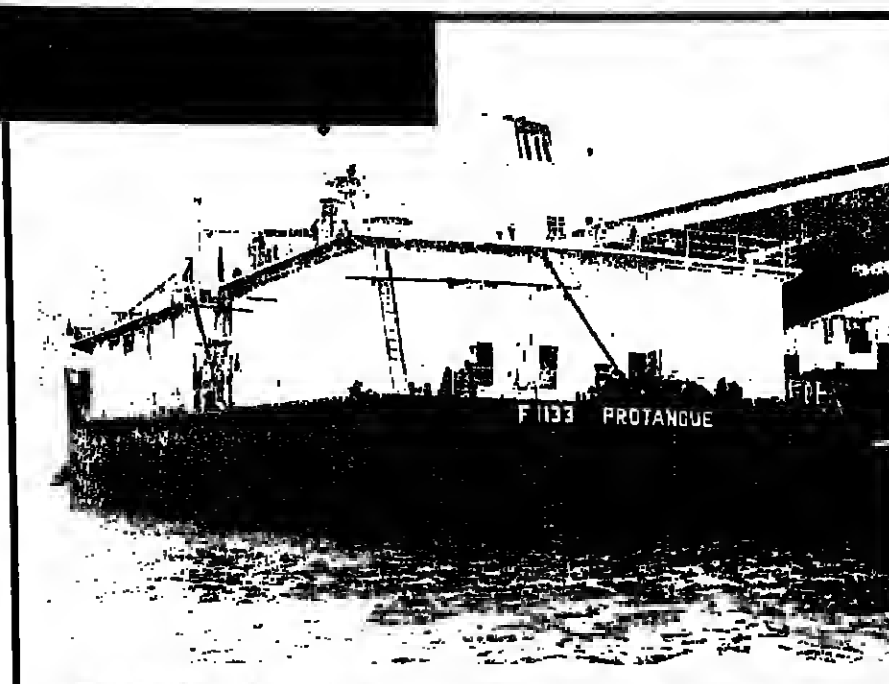
- 1 Collecting data.
- 2 Improving the quality of the fishermen's co-operatives in all respects and that of fishing communities.
- 3 Construction of landing and harbour installations.
- 4 Increasing cold storage capacity to 10,000 tons.
- 5 Improving the processing of fishery products.
- 6 Providing five more vessels for deepsea fishing.
- 7 Establishing net making and equipment producing plants.
- 8 Building link roads for fishing communities.

Training

He also announced a policy further favouring the establishment of joint ventures, not only for the better exploitation of Yemeni fishery resources but as a means for speeding up the training of Yemeni fishermen in more sophisticated fishing techniques.

While these priorities indicate the national objectives, I thought it worthwhile to try to find out what the fishermen themselves would specifically like in addition to the Government's programme.

In talks with many of them they told me they would like to have:



THE floating fish meal plant mentioned in this report was built by Stord Bortz Industri A/S of Bergen, Norway, in 1972 as the barge *Protangue*. It cost more than £1 million to build and equip, with meal plant able to handle up to 500 tons of fish a day.

The *Protangue* was intended for use by a joint venture company set up by Portuguese

firms and International Proteins Corporation of the United States.

Although the plant worked well technically, and was operated for a time in southern Angola, the project had supply problems and these led to the transfer of the barge to the Middle East.

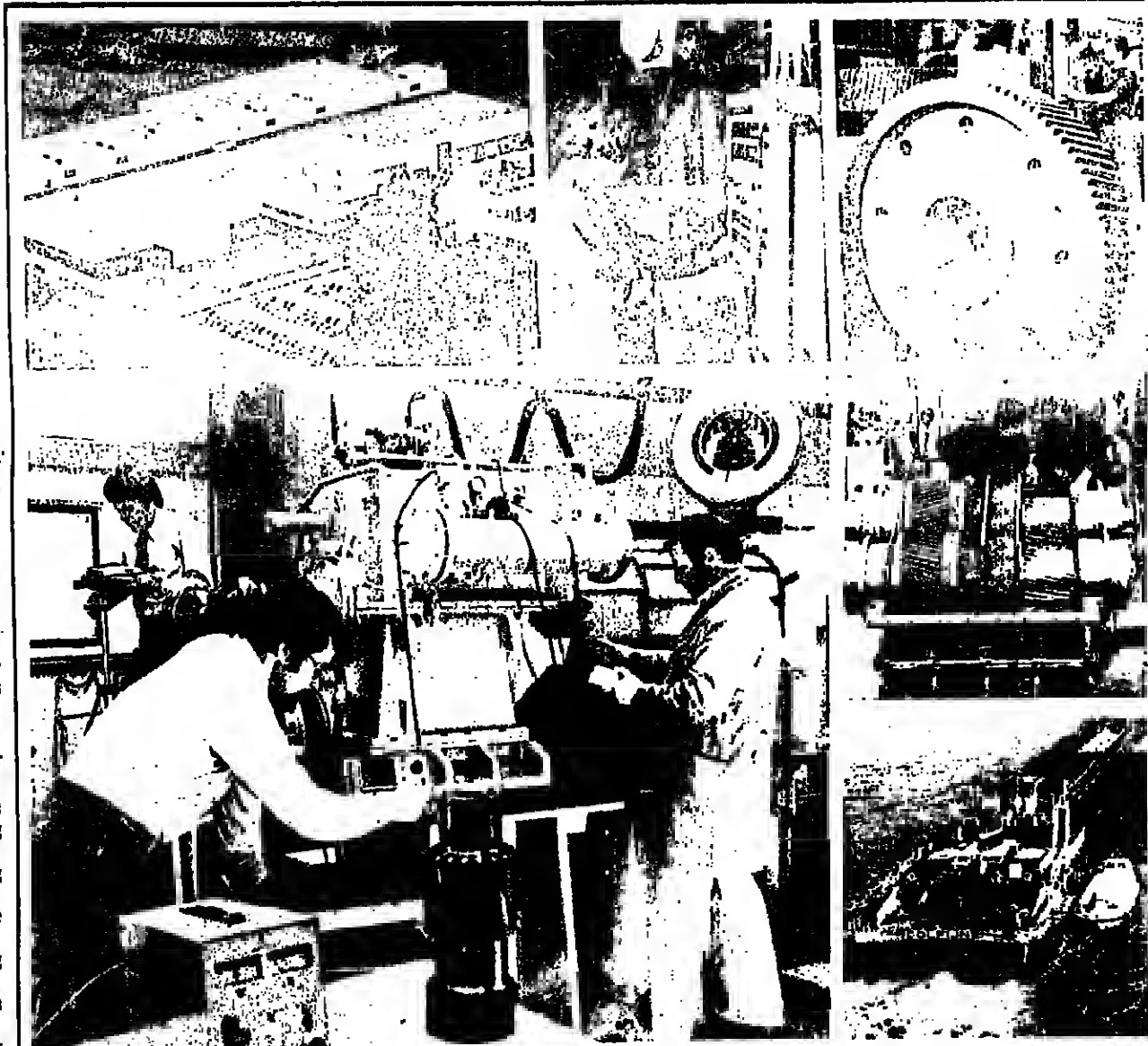
India grants import licences

THE Ministry of Agriculture in India has granted 43 licences to companies and other bodies for importing trawlers, reports *FNI* correspondent Trevor Driehorg.

Broad principles guiding the issue were experience in fisheries (including processing and marketing), managerial capability and financial soundness.

The priorities in allocations were public sector corporations, co-operative societies, small and medium fishermen's organisations, and large industrial companies.

It is estimated that about Rs 400 million (£25.5 million) will be needed for the vessel imports licensed.



The result:

More safety for the ship propulsion

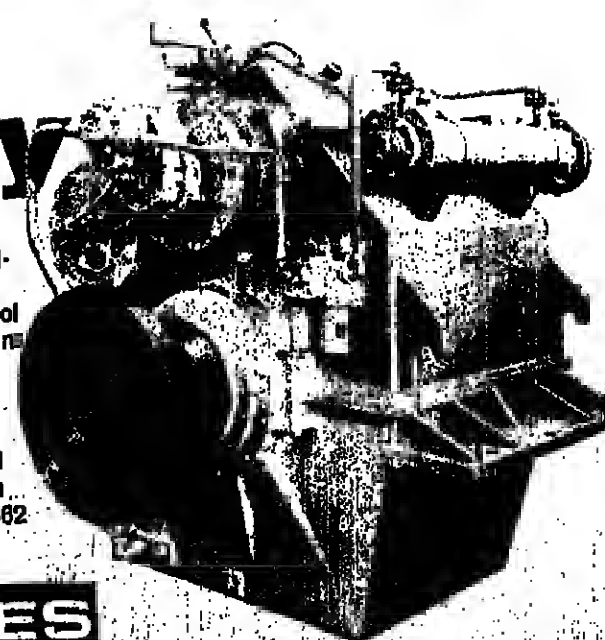
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IMCO WORKS FOR SAFER BOATS

SIR:

Your article titled "Safety rules spread to fishing boats" (February *FN*) contained many interesting points. But I would like to correct the impression it gave that the Inter-Governmental Maritime Consultative Organisation (IMCO) has so far done little for the safety of fishing vessels. This is very far from true.

Since its inception in 1969, IMCO has devoted much of its time to this matter, and during the 1980s adopted several recommendations which related specifically to fishing vessels, particularly

their intact stability.

In 1973, the Code of Safety for Fishermen and Fishing Vessels was adopted. The second part of this contains safety and health regulations for the construction and equipment of fishing vessels of 24 metres long and over.

In 1977, the Torremolinos International Convention for the Safety of Fishing Vessels was adopted. All of its provisions deal with safety matters.

The Convention applies to fishing vessels of 24 m and above. Guidelines are being developed by IMCO for the design, construction and equipment of smaller vessels.

It should also be remembered that the IMCO Collision Regulations apply to fishing vessels just as they do to other ships, and I trust that this will show that IMCO is not only aware of the need for greater safety among fishing vessels, but is also doing something about it.

In conclusion, I would like to

draw attention to the reference to IMCO's "ponderous machinery."

This may be true of some bodies with which you have come into contact, but it is scarcely true of IMCO. For proof of the speed with which the Organisation can act, I need only refer you to the Conference on Tanker Safety and

Letters...

Pollution Prevention, which was held in London in February.

Barely ten months had elapsed since President Carter asked IMCO to call this conference, yet in that time IMCO was able not only to make the necessary physical arrangements, but to involve complex Protocols to two Conventions and adopt no less than 18 Resolutions.

C. P. Srivastava,
Secretary-General, IMCO.

Crab fishing at night with pumps

SIR:

While I liked your review of Gordon Eddle's report on krill (February *FN*), I cannot help thinking there must be a better way to concentrate these creatures for harvesting than dragging small-mesh nets through the water with huge trawlers.

Although I have no direct experience with krill, I have observed at first-hand how the red crebs (*Munida gregaria*) concentrate in incredibly dense balls under lights shone at night on the water surface in the southern Chilean channels. I am certain that they could be readily harvested with night lights and pumps.

Some years ago, the FAO estimated that a sustained annual yield could be taken from this species and their relatives in the Chilean channels of 10,000 tons. Air-lift pumps operating just below the water's surface can move enormous volumes of water at a low cost in energy as they

have no gravity head to overcome.

I should think that *Munida* and other galatheids could be harvested relatively cheaply by small-boat night fishing in the protected waters of the channels.

Norwegian tests with krill caught by exploratory fishing vessels have shown that they make excellent salmon and trout feed. Chunks of frozen blocks floating in the salmon pens melt gradually, allowing the fish in the pen to nibble away at a controlled rate.

I should think that a relatively modest galatheid fishery in the southern Chilean channels could provide the feed for an expansion of intensive trout and salmon farming in South America, as well as serve as a proving ground for less energy-demanding techniques for fishing krill on the high seas.

Dr. Timothy Joyner,
Seattle, Washington, USA.

TRAWLER IS CONFISCATED

A 350-TON trawler arrested off New Zealand on January 25 and found guilty in February of illegal fishing was ordered to be confiscated.

The trawler *Tomi Maru No. 81*, owned by Kanai Fishing company of Hokkaido, was brought in by the patrol ship *Pukaki*. She was fishing at the time 65 km off the northern tip of New Zealand. It was an area closed to foreign fishing craft, and she was also using illegal size mesh.

Early in February, her captain K. Okaya and her fishing master Y. Hamada were found guilty in a Auckland court of illegal fishing. The captain was fined \$NZ10,000 on the illegal mesh charge and \$NZ25,000 for fishing in a restricted zone. The fishing master was fined \$NZ3,500 and \$NZ2,500 on the two charges.

The court also ordered confiscation of the ship, the Magistrate saying that, as the first case of its kind, a warning should be read into the penalties.

Although there has been some comment in Japan on the severity of the penalties, the Minister of Fisheries, Mr. J. B. Bolger, denied any special severity towards Japan. The same sort of action would be taken against any foreign ship found guilty of illegal fishing under New Zealand's new limits laws.

The captain of the *Tomi Maru 81* pleaded ignorance of

the new regulations. But his ship had been in Wellington only five days before the offence. A New Zealand fisheries officer said he had called aboard the vessel and had discussed the regulations with two crew members and a director of the owning company.

The illegal mesh size was regarded as a particularly serious aspect of the case. This was below the NZ legal minimum. In addition, the coil-end had a liner of small mesh which had doubled.

Advantage

There is a feeling in New Zealand fisheries that for too long the foreign vessels have taken advantage of a fairly lenient attitude towards them. The fines, and the loss to her owners of a six-year-old ship worth more than \$NZ1 million is a warning that there will be no more leniency. And that NZ means to enforce its new limits and protect her resources.

POLFISH

The new name in fishery development

POLFISH appears this month as a new name in fishery development. Behind it are the considerable technical and other services of Polish shipyards, factories, training schools and research organisations. The new comprehensive service is being launched in April at Expo Pesca, the fishery exhibition in Puerto Rico. It has been formed in conjunction with Centromor, the Polish shipbuilding and equipment export organisation.

It is intended to function as a specialised advisory, aid and sales service to countries finding themselves with greatly extended fishing zones but without the catching power to exploit them effectively. For this reason, Polfish is aimed at nations having a catch potential around 10,000 tons a year or more, which puts the new organisation outside the field of fisheries development in the classic sense — that is, the small scale or artisanal fisheries.

The range of vessels proposed by Polfish begins with combination trawlers, shrimp boats and line boats of around 32 metres. It extends right up to mother ships and includes purse seiners and trawlers.

This means that any type of offshore resource can be fished with the right vessel for the job. As more than 30 types have been supplied to Poland's customers in the past, there should be no problem in finding the right one.

South Yemen

continued from page 47

1. Ice available at all times and cold storage for their catches.
2. Improved machinery and equipment on board to lessen the demand on human strength and effort.
3. Guidance to new resources in their areas of operation, such as the findings of surveys and exploratory fishing.
4. Public services, such as electricity and clean water, and better roads in their communities.
5. Modern houses and facilities in place of their present inadequate homes.

Relative to community development schemes, such as house building organised through their co-operatives, they appeared not to have given much thought to this aspect, assuming that "the government" would take the required initiative. However, some fishermen in all the villages visited responded favourably to the idea and declared they would be prepared to work voluntarily on such schemes during the periods they could not fish.

A visitor to this small developing country of South Yemen gains an impression of drive and purpose. The achievements in recent years and the ambitious plans, as outlined here, support this view. And perhaps the most encouraging sign is not that of construction and industry but the appearance of the children. The schoolboys and girls are conspicuous in their clean and tidy uniforms and appear healthy and well-fed — a symbol of hope for the future.

Many methods

The same applies to gear, which is also to be supplied through Polfish. Polish vessels have fished with many methods and in many waters, while an even greater variety of overseas fisheries have been served by both yard and factories.

This experience enables Polish

factories and their design staffs to provide practically any type of fishing gear, deck gear or shore equipment.

A novel feature of the Polfish proposals is the use of modular, self-contained "fishing bases" which can be sited on shore or built on pontoons as semi-mobile units to be moved in sheltered water. Each base incorporates a vessel service facility with haul-out or lift for two vessels, plus workshops, fuel and water stores.

Well placed

Poland is particularly well placed to fill the role planned for Polfish. She is high among the world's fishing vessel building nations, with export customers in no less than 18 nations.

As for her fishing expertise, her phenomenal growth over the past 25 years speaks for itself. Poland has risen from a nation of enter fishermen to a world fishing power, catching around 800,000 tons a year.

The most likely areas for Polfish could be the South American continent, South-east Asia and the Pacific where the 200-mile regime has given coastal states fishing grounds far beyond their means to exploit.

It is no coincidence therefore that the first public announcement of Polfish, outside the press, will be the fisheries exhibition in Puerto Rico.

One and only ice plant

At a RECENT seminar in Manila, Philippines, participants heard details of an ice plant which its inventor described "as the only one of its kind."

According to Kenneth Schultz, the machine can be installed in a small boat. It measures 3.9 x 1.2 x 1.2 metres and turns out 11.3 kilo blocks.

The Schultz plant is made in the Philippines by General Hydraulics and Machinery Inc.

It is available in three sizes — 0.5, 1 and 1.5 tons. The largest of the three can produce up to 90 blocks of ice of 30 lbs. each a day.

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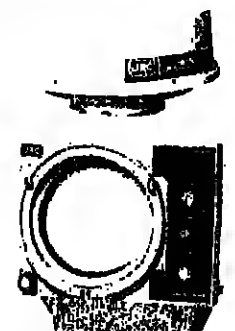
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JMA-306
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SCANNER UNIT NKE-177
A 3.5ft. and-fed slotted waveguide antenna and a 4.5kW transmitter-receiver.

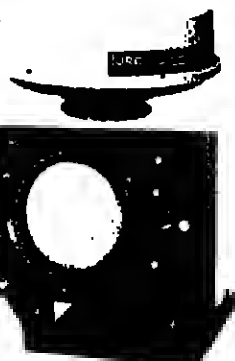
DISPLAY UNIT NCD-461
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JMA-305
3cm 3ft. 4.5kW 7in. 40n.m.

SCANNER UNIT NKE-176
A center-fed slotted waveguide antenna and a 4.5kW transmitter-receiver housed in a 3ft-dia. FRP radome.

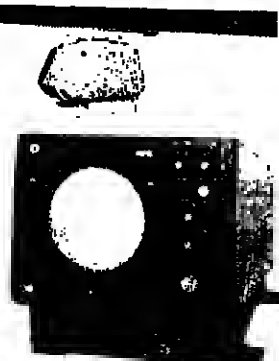
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JMA-310
3cm 4ft. 8ft. 10kW 7in. 84n.m.

SCANNER UNIT NKE-178-4/NKE-178-8
A 4ft. or 8ft. slotted waveguide antenna and a 10kW transmitter-receiver.

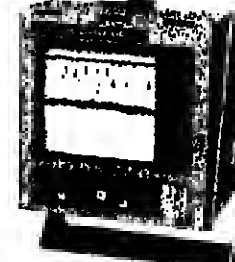
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JRC PORTABLE FISH FINDERS

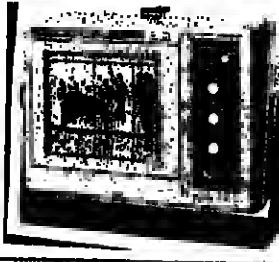
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Designed for pleasure boat use.
S-type (0-30m), M-type (0-60m) and O-type (0-120m) available.
75kHz transducer unit.
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OC12-32V operation.



NJA-550

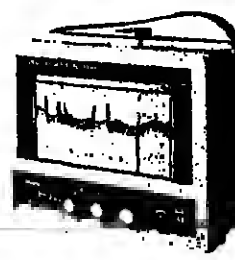
Designed for coastal fishing.
A-type (0-210m), B-type (0-420m) and C-type (0-840m) available.
200kHz or 50kHz transducer unit.
100W power output.
OC12-32V operation.



JRC ZOOM FISH FINDER

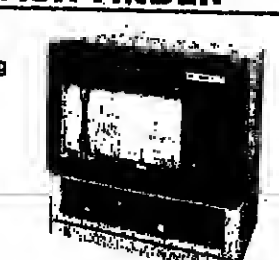
NJA-158

Designed for inshore fishing.
A-type (0-390m) and B-type (0-780m) available.
50kHz transducer unit.
100W/20W power output.
OC12-36V operation.



NJA-310

Designed for various fishing methods.
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99 ranges in 10m steps from 10m to 990m.
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